The Mining Journal

Established 1835 — Railway & Commercial Gazette

Vol. CCXLI No. 6150 — LONDON, JULY 3, 1953 — PRICE 8d

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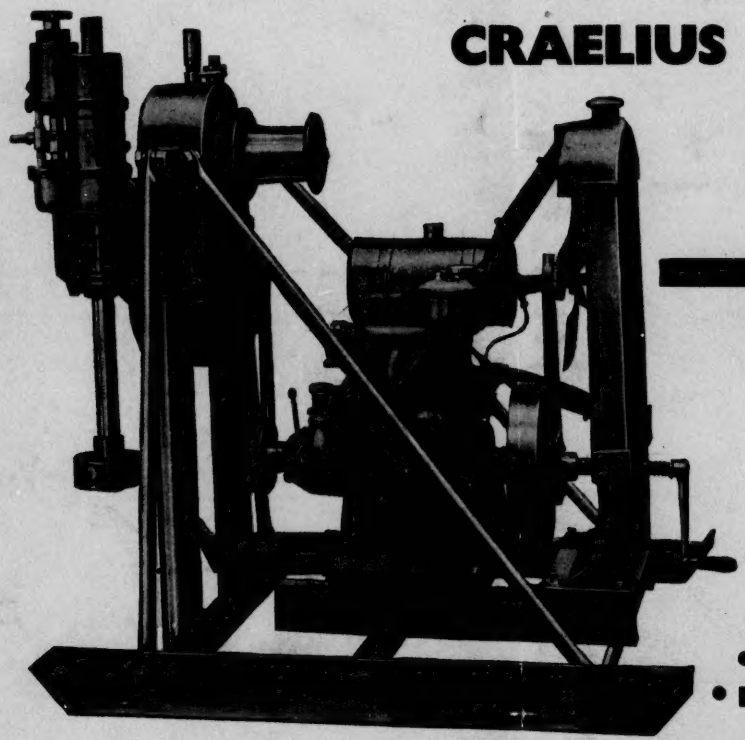

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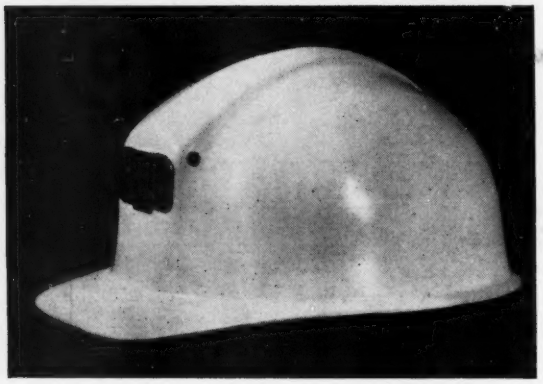

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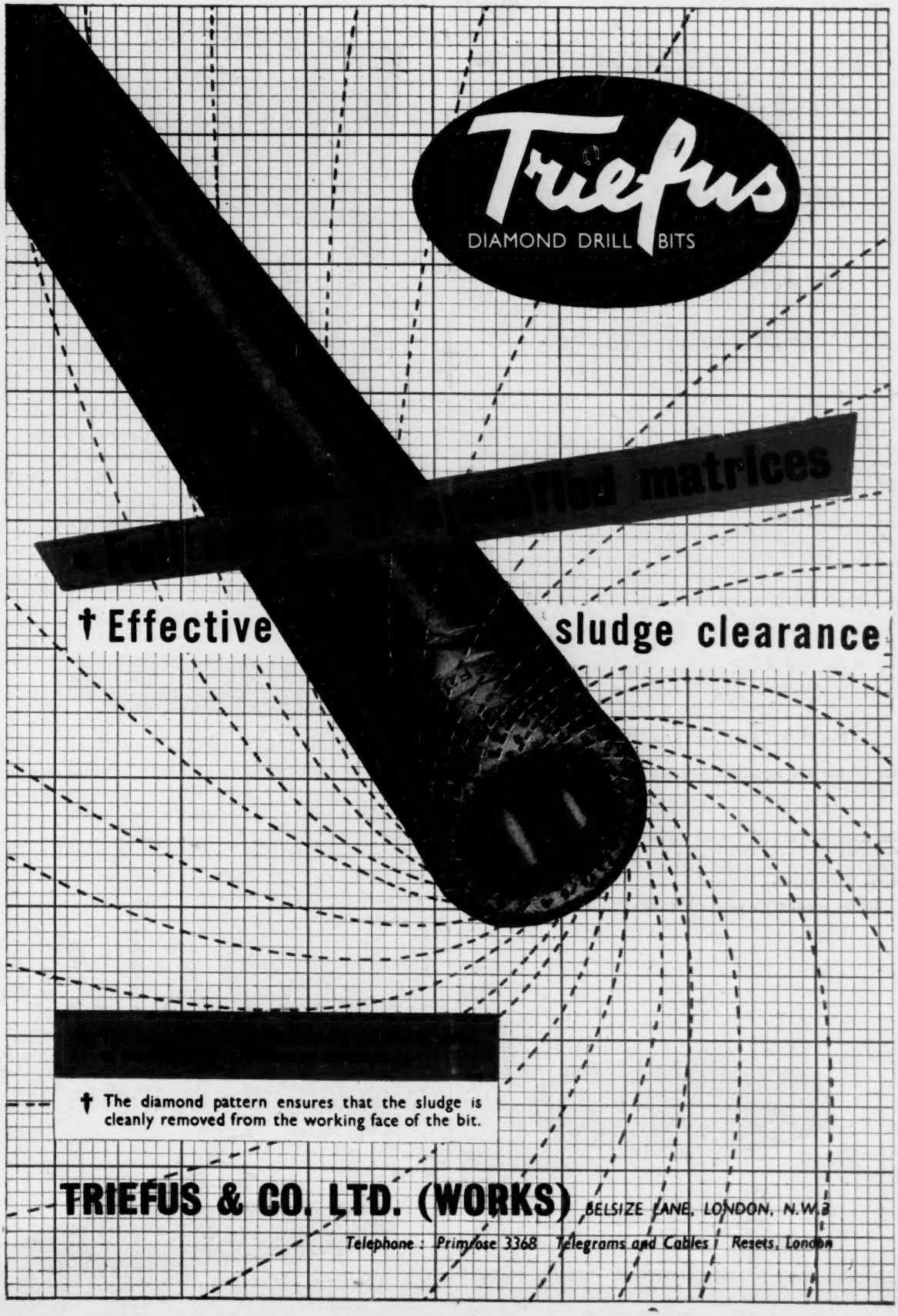
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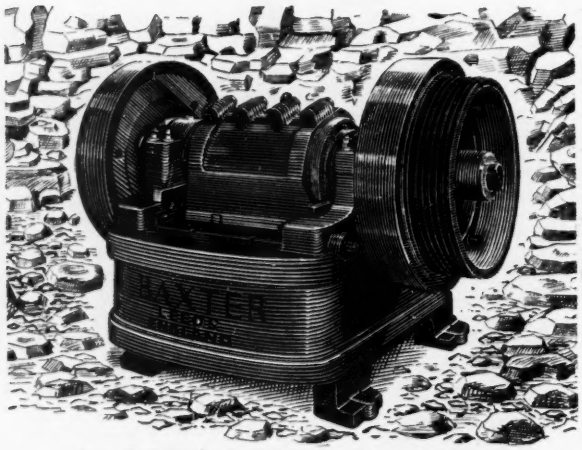

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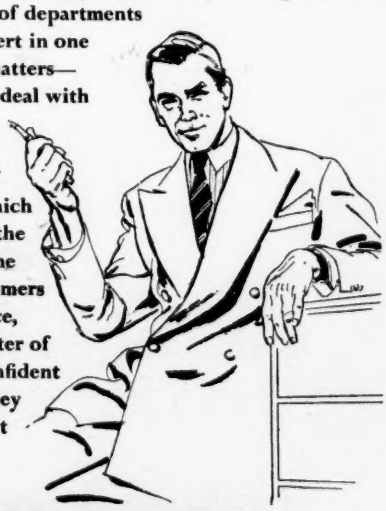

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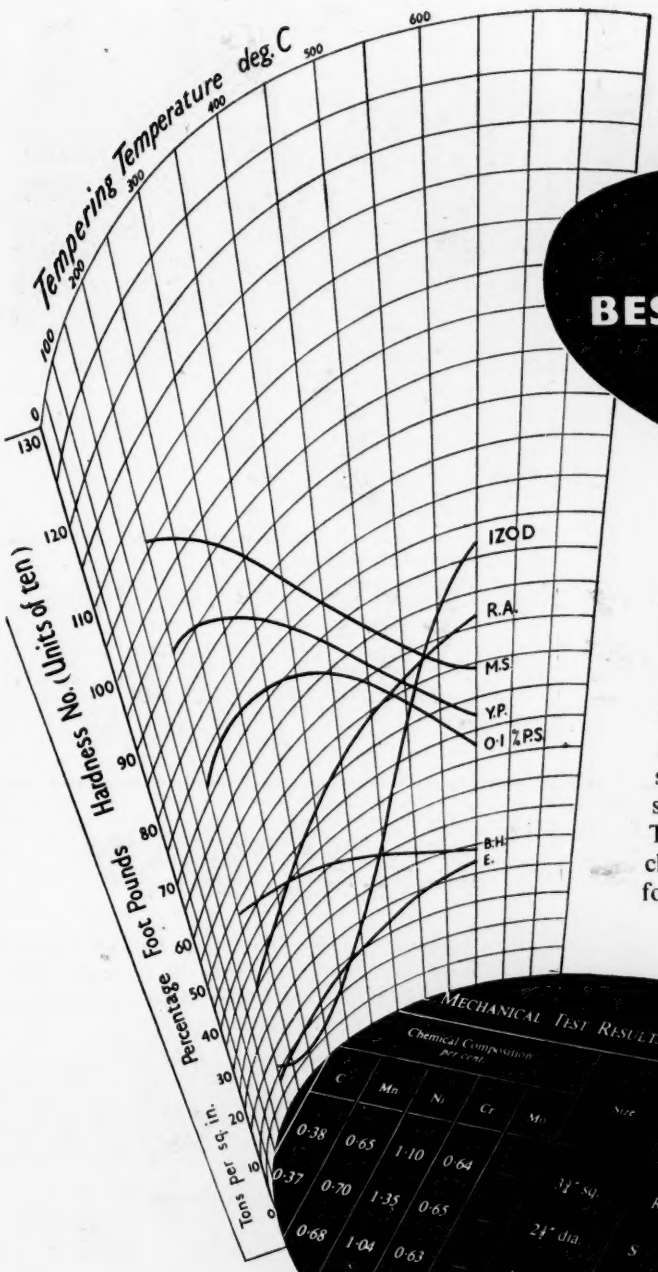

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0·37	0·70	1·35	0·65		2½" dia.	S	"	"	47·4	55·6	22
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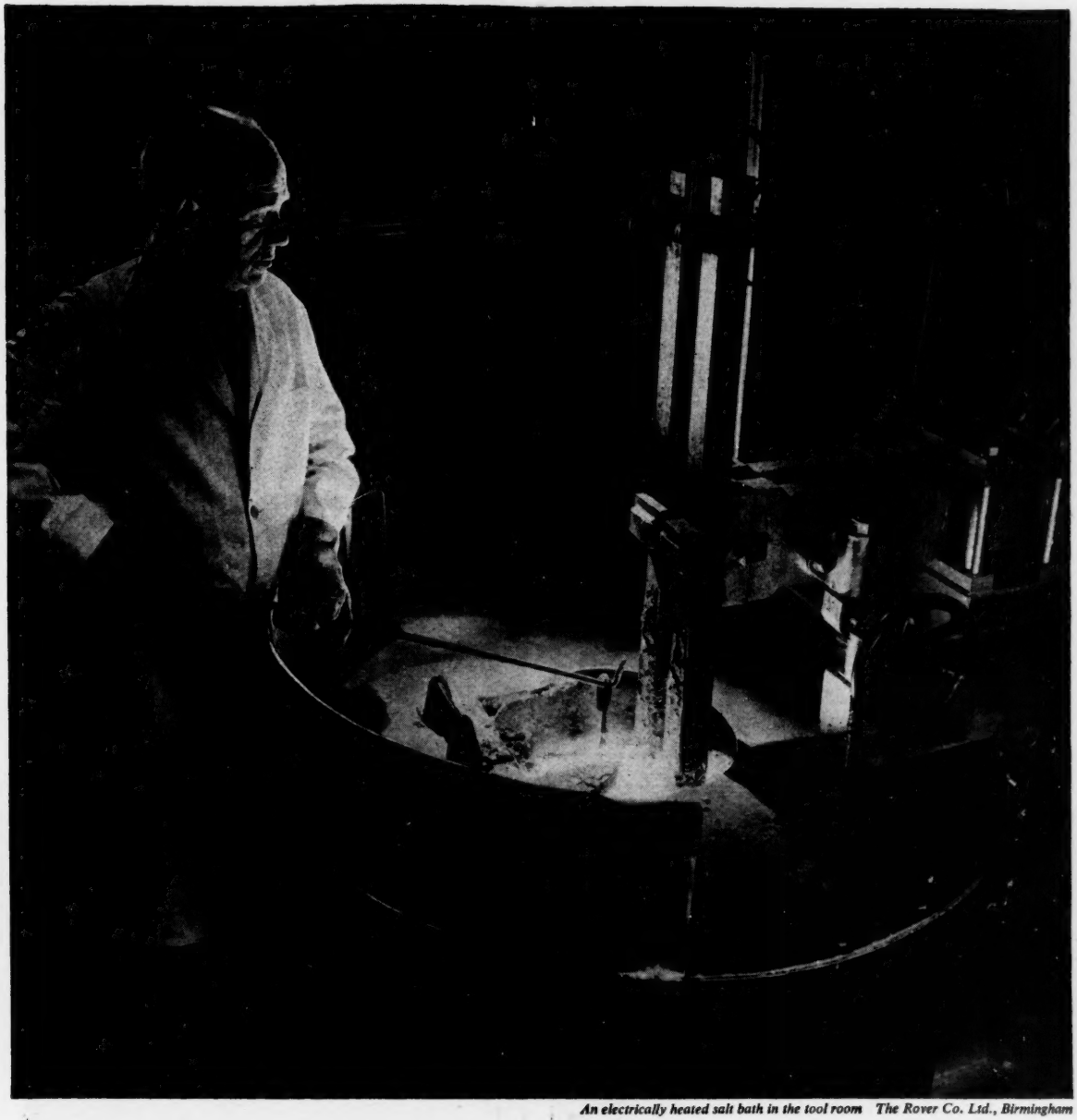

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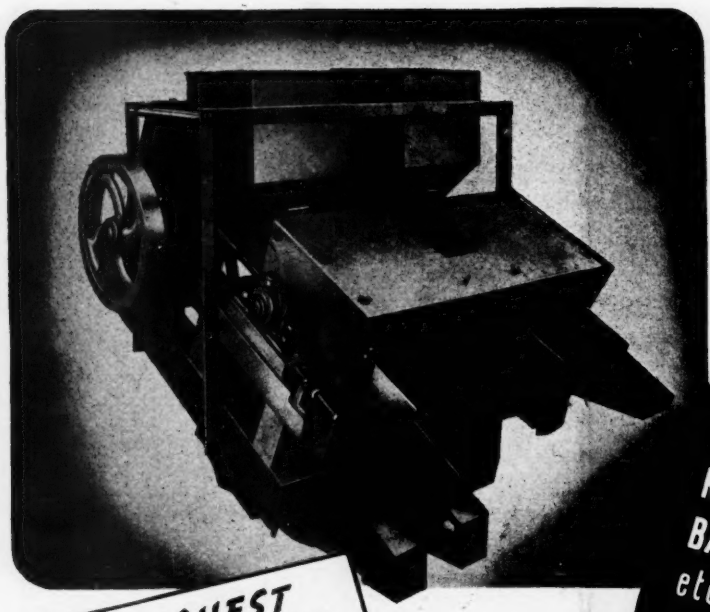

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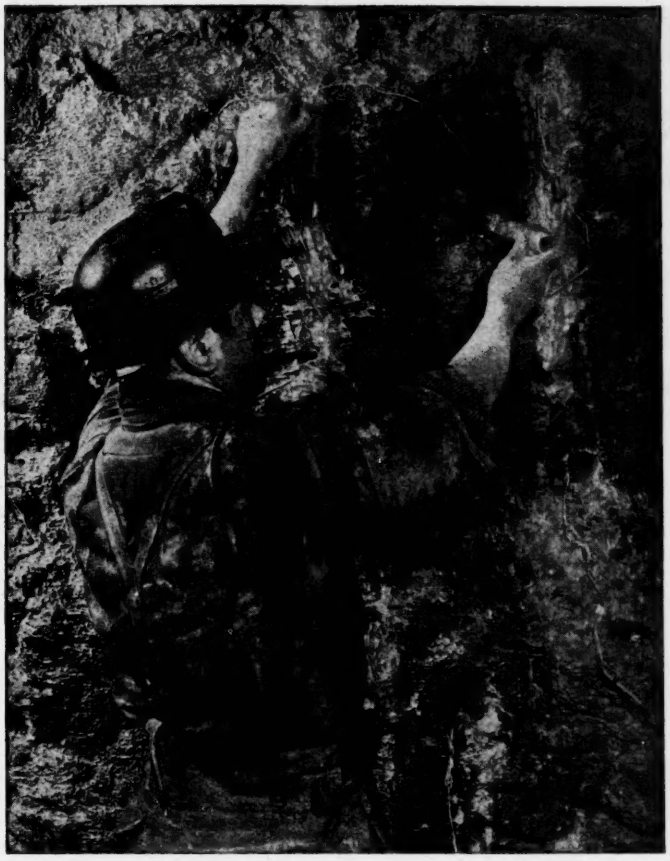

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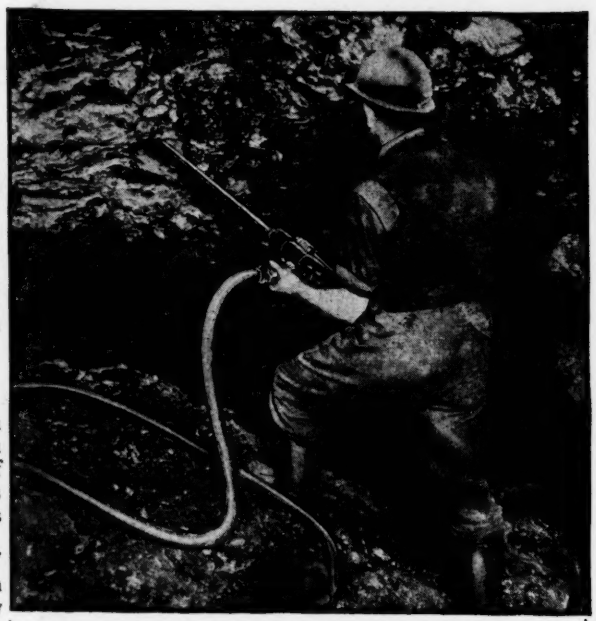

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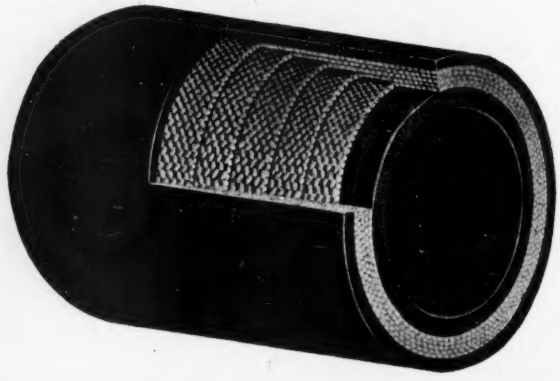

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NOTES AND COMMENTS

The International Tin Study Group's Working Party

The discussions of the working party of the International Tin Study Group in Brussels terminated at the end of last week. Only an extreme optimist could have expected any immediate result from their deliberations, as they were in no sense plenipotentiaries and the most important party, the United States delegation, were not empowered to commit their Government. As no disclosure of the debates and conclusions has been permitted, it is almost impossible to judge of the positions assumed by the representatives of the different countries. The Working Party has now reported back to the governments concerned, who are asked to state before August 15 whether they will agree to a reconvening of the Geneva Tin Conference, which was adjourned *sine die* in 1950. The impression prevalent is that the English representatives recommended the reconstitution of a buffer stock to be financed by the governments of the producing countries, but that the Belgian Government is opposed to the idea of government financing, holding that the finance should come from the producing countries.

It is understood that Mr. Peter who headed the French delegation has been asked to enquire from the steering committee of the United Nations conferences whether that body considers that the time has come to reconvene a United Nations Tin Conference; but this could hardly go into action before the end of the year. Obviously the deferring of any action would give time to see how the situation develops and whether the United States is prepared to clarify its policy as regards the continuation of stockpiling and also presumably whether, in the interests of social security in the chief producing countries, it is willing to give any other financial assistance. The fundamental issue must be to get rid of a permanent situation of over-production. This can be achieved either by the artificial brake of a general restriction of output, or by the natural effect of a reduction in price.

The inherent difficulty is, of course, to reconcile the ideas of producers and consumers. A price which would satisfy consumers' interest, which in effect means the United States, is unlikely to satisfy many producers. The consumer is now in a more independent position than when Restriction was in operation between 1930 and 1949. Indeed the Paley Report has suggested that consumers in the United States would, if necessary, be able to meet their needs eventually through the growing availability of substitutes, were supplies to be severely restricted by economic pressure. They would probably be stiffer in their attitude were compulsory price regulation to be the outcome. The data available at present are, however, too hypothetical for realistic conclusions to be possible. In favour of stockpiling it might perhaps be said that we have had, and indeed still experience, a condition equivalent to international tin control through U.S. stockpile buying. We have no means of knowing whether any hints were forthcoming from the American delegation as to the magnitude of the stockpile and their probable intentions regarding its maintenance. It is the fear of its termination which has been mainly responsible for the heavy fall in prices in the last few months.

The price to-day stands roughly where it did when the Korean trouble began at the beginning of July, 1950, leading to the general boost of all base metal prices to record and fantastic levels. We did not hear then of imminent suspension of tin mine operations in most fields. This reflection may help to explain why there is so far no evidence of a falling off in output by the tin producing countries. Costs have no doubt increased since mid-1950, and governments have extracted a larger share of the profits, but if wage rates can be lowered to correspond to the price decline, and governments can be induced to modify their appetites for a big rake-off, there seems no certainty that world output need decline sensationally—at any rate not necessarily more than consumption. Here we have a problem which can be answered only by experience.

Electrolytic Tin Plate May Benefit the Tin Producer

About ten years ago, when electrolytic tin plating was first being discussed, the view was confidently expressed in this country that it would never be a serious competitor for the older methods of making tin plate, at any rate when the container was not likely to be opened for several months, or where it was liable to rough handling. Alternatively it was argued that if electrolytic tin plating proved a satisfactory substitute for hot dipping the increasing economy would result in a big expansion in the use of tin plate and consequently that tin consumption would thereby be stimulated. Whether these two alternatives are as

optimistically regarded to-day may be doubted.

In this connection a report just issued by the U.S. Bureau of Mines states that the total amount of tin consumed in manufacturing plate last year in the United States was 28,965 tons compared with 32,172 tons in 1951. Some of the decline was of course accounted for by the steel strike in the U.S. last year, when 4,020,830 s.tons of plate were manufactured compared with 4,389,050 s.tons in 1951, but the main cause of the decline would appear to have been the progressive increase in the percentage of electrolytic tin which claimed 67 per cent of the total output as against 33 per cent for hot dipped products. Consumption of tin for hot dipped plate increased slightly to 25.7 lb. per s.ton, while the consumption for electrolytic plate was fractionally less at 9.1 lb. per s.ton. These figures correspond approximately to 1¼ per cent of tin for hot dipped and 0.45 per cent for electrolytic.

Very low figures are sometimes mentioned for some particular ranges of electrolytic plate but it is not always easy to judge of the average consumption, especially as the average is probably tending lower all the time. We noted recently in *The Mining Journal* that it has been decided in Washington to increase electrolytic tin plate capacity of the country to 4,500,000 s.tons by the end of next year as compared with last year's actual make of 2,712,657 s.tons, in order to conserve tin through the increased use of electrolytic plating. This seems to justify the opinion expressed earlier in the year by Mr. Ilgenfritz, of the U.S. Steel Corporation, that tin of the equivalent of $1.21½ is not going to be used if anything cheaper can be found to do the job. Clearly, with a consumption last year of 9.1 lb. per s.ton of electrolytic plate as compared with 25.7 lb. for hot dipped, the U.S. canning industry has, quite apart from the heavy fall in the price of raw tin, been able by improved metallurgy to reduce the cost of tin substantially in the production of a box of plates and so improve the prospects of tin consumption compared with other possible substitutes.

Mr. McLean on the Union's Gold Industry

During his presidential address in Johannesburg on June 29, Mr. C. S. McLean, President of the Transvaal Chamber of Mines, made some pertinent remarks on the growth of South Africa's uranium industry as well as on the gold mining industry itself.

He insisted that the belief that all South African gold mines would ultimately become uranium producers had no logical justification, as nature had been capricious in her placing of uranium in gold-bearing reefs. It is apparent that this belief has been held in the Union and overseas, and it is perhaps not surprising that such a notion should arise, as a certain amount of misunderstanding regarding the magnitude of the Union's uranium production programme has resulted from the " blanket of secrecy " on the amount of information which gold mining companies are allowed to give their shareholders. Although, as Mr. McLean emphasized, a certain amount of secrecy is essential, particularly on technical aspects of the production process, it is nevertheless felt that undue limitations have been imposed on gold mining companies in the information which they are allowed to reveal to their shareholders. For the investor is entitled at least to " sufficient information to enable him properly to assess the potentialities of his investments."

The constructive role played by the South African investor cannot be too strongly emphasized. He stands as an integral part of the industry and represents a fair cross-section of the community. He must be the concern of management and labour alike and in the national interest he must receive the same protection as that afforded his " sleeping partner," the State.

Mention of the extraction process used in uranium recovery at Daggafontein Mines was made in *The Mining Journal* of June 12, 1953, and now in addition to the Blyvoor uranium plant starting up this week, it has been announced that Western Reefs Exploration and Development Company is shortly to join the list of uranium producers. Indeed, favourable comment from the relevant authorities in the United Kingdom and the United States, the countries financing the entire South African uranium venture, has been directed towards the Union for the alacrity with which uranium plants have been erected and brought to the production stage. The production of uranium is undoubtedly an event of great importance that has considerably expanded the activities of the South African gold mining industry. In its wake has come the birth of an ancillary industry in the manufacture of sulphuric acid, which is necessary in considerable quantities in the uranium extraction process, and it is an interesting fact that the acid is being produced by selected mines from pyrite contained in the gold-bearing ores which for the greater part has hitherto been regarded as a waste product.

Speaking of the gold mining industry, Mr. McLean felt that inevitably the time must come when shadows clouding the present must disperse. The industry would then be revealed in its rightful place as the mainstay of South Africa's industrial and commercial life. It would seem that the peak of the Union's high cost structure was close at hand, and if this were so the gold mining industry could regard the immediate future with relief and optimism. The upward curve of costs in the operation of mines was now rising less steeply, and this might be regarded as a welcome portent. He added that the Gold Producers' Committee had accepted the Union Finance Minister's decision that the present was not the time to increase the amount of gold made available for non-monetary purposes.

Mr. McLean said that to the end of last year nearly £100,000,000 had been spent on capital works in the gold fields of the Orange Free State and estimates on the broadest lines were that over the next decade a further £85,000,000 would be required as a minimum assessment. Yet no evidence has been found to suggest that the new Orange Free State gold fields will belie their promise. Certain comparisons have in the past been drawn between the initial production results of mines in that area and the older mines of the Witwatersrand. In fact, these conditions are not comparable owing to the difference in costs in the pre-war and post-war periods. South African policy is directed towards prolonging the life of the industry by exploiting the maximum amount of ore underlying the fields, and the premature closure of any mine will be contrary to the national interest. On the Rand, rising costs and shortages are creating a difficult period for the older producers, but Mr. McLean suggested that these two factors were common to mining the world over. He felt that increased costs could be countered by a period of deflation and ultimately by a further substantial increase in the price of gold.

The *M.J.* Reverts To Its Pre-War Size

Many of our readers will recall the wartime economy measures which necessitated the margins of *The Mining Journal* pages being trimmed to save paper. At the time, this threatened to be " for the duration " only, but the tremendous increases in paper costs which occurred after the war delayed the day when it seemed feasible to return to pre-war standards. Now, with paper supplies reasonably assured and prices somewhat down from their peak of a year or two back we are reverting, with this issue—the first of a new volume—to approximately our pre-war page size. We believe that our readers and advertisers alike will welcome this change, while the latter may like to be reminded that the type area of the page will remain unaffected.

Western United States

(From Our Own Correspondent)

Portland, Oregon, June 20.

The mining industry, as a whole, is very much encouraged over the personnel of the new administration, especially with respect to the Department of the Interior which administers the bureaus connected with mining. The newly appointed secretary, Mr. Douglas MacKay, was formerly Governor of Oregon, one of the Pacific Coast States, and as Assistant Secretary for Mineral Resources he has designated Mr. Felix Wormser, well known author and mining engineer and vice-president of St. Joseph Lead Co. at the time of his appointment. With such men the industry feels that its problems will receive sympathetic and understanding consideration.

Of the many domestic problems confronting the administration tariffs is one of the most acute. The plan for a differential tariff on lead and zinc is one of the most controversial points and one on which there is the widest variety of opinion, in some cases where one would expect agreement. Hopes for such a tariff were somewhat dimmed when Mr. Eisenhower sent a message to the House Ways and Means Committee which might be summed up as saying that he understands how the mining industry feels but considers that it should go along with a policy " essential to the security and economic welfare of this nation and other free countries," obviously referring to a lowering of the tariffs.

DEVELOPMENT IN THE COPPER INDUSTRY

American Smelting and Refining Co. is engaged in a development campaign at its Silver Bell mine in Arizona which will involve ultimate capital expenditure of $17,000,000 and will include a 7,500 ton flotation mill and a townsite. Silver Bell has been idle for the last quarter of a century, but recent exploration has indicated a large tonnage of low grade ore, less than one per cent copper, which will sustain an annual output of 18,000 s.tons. Operation is expected to start in 1954 and the government has guaranteed a minimum price of 25 c. on 88,500 s.tons of the first 98,500 s.tons produced. Castle Dome (Miami Copper Co.), in Gila County, Arizona, will cease operations late this year and the plant and equipment will be moved to Miami's Sleeping Beauty in the same general locality.

OPTIMISTIC VIEW IN LEAD-ZINC FIELD

While depressing reports of more closures of lead and zinc mines continue it is evident that long range view of the industry is by no means pessimistic as witness expansions and developments presently under way. The shutdown of one of the four units of Sullivan Mining Co.'s zinc plant was of short duration. The move was induced by a falling off in the supply of lead-zinc concentrates from the Coeur d'Alene district, where the plant is situated, but other sources of supply were found which enabled resumption of operations. International Smelting and Refining Co. has started up its plant at Tooele, Utah, which has been idle since the first of the year because of shortage of zinc-lead concentrates. Stockpiling was carried on during the shutdown and it is expected that with this reserve normal operation can be maintained throughout the rest of 1953.

Extensive diamond drilling has indicated substantial ore reserves at American Zinc, Lead and Smelting Co.'s holdings adjoining its Grandview mine at Metaline Falls, Washington, and development plans, which include a 1,400 ft. shaft, are under way. American Smelting and Refining Co. has started construction of a 200 ton zinc-lead mill at its Keystone mine in Gunnison County, Colorado. U.S. Smelting, Refining and Mining Co. has reduced operations from six to five days at its U.S., Bingham and Lark, and Ophir mines in Utah, affecting 1,100 employees. Following the closing of the Shenandoah-Dives in the San Juan district in Colorado, its neighbour, Telluride Mines, planned to follow suit but was spared by the purchase of its stock by Idarado Mining Co. which will continue operation of Telluride. Telluride holdings included some of the well known names, such as Smuggler Union, of the days when the San Juan district was noted for its sensational high grade ore. Idarado is owned by Newmont, Homestake and Mine and Smelter Supply Co. and Telluride now becomes its wholly owned subsidiary.

PROBLEMS CONFRONTING GOLD MINES

The gold mining industry is hoping for some relief from the situation that has plagued it for the past ten years but realizes that with the many problems that confront the new administration it may be some time before its turn comes. That there is some optimism is indicated by the fact that the first four months of the present year show a slight increase in production over the corresponding 1952 period. Some mines that have been shut down are making preparations for reopening and during the summer Yuba Consolidated Goldfields will put a new dredge into operation at its Hammonton field in California. The new boat will have an annual capacity of 4,000,000 cu. yd. and can dig 107 ft. below the water line.

In Alaska the dredging season has opened and Fairbanks Exploration Co. (U.S. Smelting) has three dredges in operation and three more in preparation. Alaska Juneau Gold Mining Co. is negotiating the transfer of its power plants and some of its realty holdings to a company organized for the manufacture of wood pulp. The negotiations provide that should Alaska Juneau resume operations it will be furnished the necessary power. This company established an outstanding record over many years for low cost operation and in the 12 years prior to 1942 paid in excess of $14,000,000 in dividends from ore averaging about $1 per ton. Rising costs and Order L 208 of 1942 spelled " finish " to its operations.

On the other side of the picture Empire Star at Grass Valley, California, has abandoned its lower workings and is letting them fill with water. Before consolidation as Empire Star, the Empire and North Star mines were close rivals as to which was the leading gold producer of California. North Star, whose holdings embraced the first lode mining claim located in the West, was operated through an incline which attained depth in excess of 10,000 ft. on vein.

URANIUM

Although it is known that production of fissionable minerals is under way, and it is believed that encouraging results are being attained, no figures or other information are available and interest is largely centred on development. In the Colorado Platteau region contracts for diamond drilling totalling 27,000 ft. have been let to one contractor and in Southwestern Utah Western Gold Mines, operating the old Silver Reef mine, has contracted with the A.E.C. to drill 300 test holes. Silver Reef is a geological curiosity which more than a half century ago yielded very rich ores of native silver occurring as replacement of vegetable matter in sandstone. Now these same sandstones are found to carry uranium although the actual value in that respect has not been fully determined.

In alloy metals tungsten production during the first three months of 1953 was the highest for any quarter since 1944. Development of small properties continues and it is from a number of such as these that the country derives a considerable part of its tungsten production.

ASIA'S MINERAL RESOURCES—II

Progress of Geological Surveying in the Far East

Last week we published an article giving an overall picture of the work of the recent Regional Conference on Mineral Resource Development, held in Tokyo under the auspices of the United Nations Economic Commission for Asia and the Far East. One of the important points which emerge from the Conference is that a tremendous amount of geological surveying and mapping of the region still remains to be done. The article which follows summarizes the information submitted to the Conference regarding the present state of advancement of geological surveying in the countries concerned.

A point which emerged very clearly from the Conference is that geological formation and structure have little to do with geographical or political boundaries. This utilitarian consideration demands the early completion of a geological map of the region. Despite the inadequacy of current geological knowledge, certain valuable information is already available and the region cannot be considered as a geologically unknown area. In the beginning a small scale map may be produced, and this can be enlarged as additional knowledge becomes available. The successful completion of such a task depends on the co-ordinated efforts of regional experts, particularly regarding the scale to be adopted, colour scheme, and division and correlation of geological formation.

SHORTAGE OF TECHNICAL STAFF

The region as a whole is short of technical staff. Training facilities are either non-existent or inadequate in most countries of the region. Ceylon, Malaya, Cambodia, Laos, Viet-Nam, Nepal and British Borneo have no university facilities at present. Geological studies were offered at the University of Hanoi in Viet-Nam, but since 1945 they have been stopped. The University of Hong Kong recently opened a Department of Geology and Burma has a Department of Geology in the University of Rangoon. The Technical University of Indonesia started a Department of Geology and Mining in 1949. Courses in geology and mining engineering are given in the Chulalongkorn University, Thailand, and in several universities in the Philippines. In China (mainland), six universities offer training courses in geology.

India and Japan both have comparatively adequate facilities for training geologists. In fact, in India there is apparently an over-production of graduates in geology, since the mining industry at present still uses very few geologists, and steady employment is offered only by the Government. Although young graduates may be abundant in India, however, qualified ones who can be trusted with independent work are few. Twenty-three universities in Japan offer training in geology and the Japanese Ministry of Education has expressed its willingness to take students from the E.C.A.F.E. countries. There are enough facilities for at least 30 students of geology at a time.

In the more industrially developed countries of the West, mining companies have contributed a substantial share in advancing the geological knowledge of their countries. In practice, Government Surveys carry out explorations for unknown mineral districts, while mining companies search for extensions to known deposits and prospect in areas likely to have minerals of economic value. In this region mining concerns, with the exception of a few oil companies, have yet to be convinced of the usefulness of geologists, especially for guiding the development work. The geological mapping of a country is therefore entirely the responsibility of the national Geological Survey concerned, which is usually understaffed.

Several countries of the region are making increasing use of aerial surveys for their various projects of economic development. In the latter part of 1951, it was reported that the Governments of Pakistan and India had granted the Standard Vacuum Oil Company permission to make a geophysical survey of the Bengal Basin by the air-borne magnetometer. The aerial reconnaissance was to cover a 73,000 sq. mile section of the great alluvial plain at the head of the Bay of Bengal. In March last year, the Parliamentary Assistant to the Canadian Minister for External Affairs informed the Canadian House of Commons that Canada had tentatively agreed to make an aerial photographic survey of the resources of Pakistan. In Sarawak, work carried out up to June 30, 1951, included a reconnaissance aerial photo-geological map of some 3,500 sq. miles of the western part of the country on a scale of two miles to an inch. The Director of the Geological Survey of the British Territories in Borneo estimated that it might well have taken some five years of field work for a geologist to obtain the same amount of information. In Thailand, at the end of World War II, an aerial survey of the country was carried out by the R.A.F. During the early part of 1951, a total area of 19,425 sq. ks. was air-surveyed.

PLANS FOR SYSTEMATIC SURVEYING

Practically all countries of the region have plans to complete a systematic survey as soon as possible. Since the sizes of countries differ, the scales of the contemplated surveys also vary, depending largely on the staff resources and the scales of topographical maps now available. For countries using the British measure system, 1 in. to 1 mile is usually taken as the standard scale for systematic survey; for countries using the metric system, 1 to 50,000 is considered to be the smallest scale of much practical use.

At present, British Borneo, China, Ceylon, India, Japan and the Philippines are engaged in making systematic surveys. Burma, Malaya, Cambodia, Laos and Viet-Nam have plans to complete the mapping of their respective territories, but are handicapped either by the lack of technical staff or for security reasons.

Brief notes on the survey activities of some E.C.A.F.E. countries follow:

British Borneo

The Geological Survey Department, British Territories in Borneo, was established in 1949. It operates over approximately 80,000 sq. miles, consisting of the Colonies of Sarawak, North Borneo, and—in consultation with the British Resident—Brunei. The staff is being increased this year to seven geologists, 27 technical and clerical assistants, and a photo-geologist. Since the establishment of the Department in 1949, attention has been paid to the systematic survey of the area, and the coming few years are likely to be mostly occupied with similar work. Geological surveying was started by mapping districts where mineral deposits were known to exist; geological reconnaissance of the extensive areas of which little is known will follow.

Burma

The mineral resources of Burma have not yet been fully surveyed. In 1952 the U.S. bilateral programme retained the services of an American firm to make a mineral resources survey. The Burmese Government has requested from the United Nations Technical Assistance Administration (T.A.A.) a team of experts to assist in the development of these resources. T.A.A. agreed in principle to provide this assistance and to send in the first instance one general mining engineer on an exploratory mission in 1953, to advise the Government in the organization of the Department of Mining and on certain mineral resources development projects which are contemplated. The expert will also advise on the continuation and expansion of the project next year, when T.A.A. hopes to provide the other six experts requested. One third of Burma has yet to be mapped.

Ceylon

Ceylon has no Geological Survey or Bureau of Mines. The surveying work is entrusted to the Department of Mineralogy under the Ministry of Industries, Industrial Researches and Fisheries. The Department has at present three qualified geologists. The primary objective is to complete the surveying of the country on a scale of 1 in. to 1 mile. It is hoped that, later, these preliminary maps will form the basis for a more detailed survey on the scale of 6 in. to 1 mile.

China

After World War II, the mining areas in China were divided into two general groups—national reserves and private mining claims. In 1949, the latter totalled 6,100, with an aggregate of about 1,100,000 acres. Since the establishment of the Central People's Government in Mainland China, a new Ministry of Geology has been set up in order to intensify the exploration work in connection with the first Five-Year Plan for Mainland China. Geological work in the Ministry is carried out by two organizations: the Geological Survey of China and the Research Institute of Geology. The former has about 70 geologists and scientific officers and possesses ten laboratories. The Research Institute of Geology has about 15 geologists.

There is a Geological Survey of Formosa which is under the Provincial Government. While present production of oil in Formosa is very small, there are considerable potentialities for production in ante-clinal structures not yet explored. At the request of the Government, T.A.A. hopes to recruit towards the end of 1953 a senior geologist to assist in oil exploration for a period of two to three years.

India

In the past four years the Government has laid the foundation for minerals development by: (a) the announcement of a mineral policy; (b) the expansion of the Geological Survey; and (c) the establishment of a Bureau of Mines to secure co-ordinated development. The keynotes of India's mineral policy are conservation and economic working.

The Geological Survey of India is the oldest survey in this region, having been established over a century ago. Its present strength is 110 and a target of 273 is envisaged for 1956. The Indian Government has asked for two experts to train staff of the Survey in the use of plotting machines. A T.A.A. expert was sent in December, 1952, on an exploratory mission. In accordance with his findings, T.A.A. hopes to send an expert for six months during the current year, together with certain equipment. Other T.A.A. experts are advising the Government on modern coke oven practice, fertilizer production, and the utilization of lignite.

Japan

The Geological Survey of Japan was established more than 70 years ago and is the second oldest Survey in the region. It consists at present of more than 300 geologists and other scientific officers. Since 1950, sheet-mapping of all Japan has been conducted on a scale of 1 to 50,000.

Indo-China

There is only one geological survey in the three countries, Cambodia, Laos and Viet-Nam, comprising Indo-China. Known as the Service du Sous-Sol, it consists of two geologists and is located at Hanoi, Viet-Nam. The Government of Laos envisages the establishment of a hydro-electric dam on the Nam Theun River. The power produced by this dam will be used for irrigation, various manufactures, and for certain mineral industries. Expert assistance has been requested for this project, including the services of a geologist. This expert, who has been seconded by E.C.A.F.E., was to arrive in Laos in June.

Malaya

The east coast of Malaya which, it is believed, contains several valuable minerals, has not been geologically surveyed. The region is mainly jungle and a ground survey is therefore impracticable. The Government therefore requested expert assistance in magnetic aerial survey. T.A.A. hopes to send an expert this year for three months to conduct preliminary discussions on the possibilities of appropriate technical assistance. To date, maps on a scale of 1 in. to 1 mile are available for only 3.5 per cent of the area of the Federation of Malaya; i.e., 1,765 sq. miles out of a total of 51,076 sq. miles.

Nepal

Nepal has extensive mineral resources which have not yet been explored. The Swiss Government made available the services of an expert equipped with high precision instruments lent by the Swiss Federal Institute of Technology to the Government of Nepal. T.A.A. has now resumed responsibility for this expert, who is at present carrying out ground control surveys for stereo-photogrammetric plotting of aerial photographs previously taken by an aerial survey company.

Pakistan

At the time of partition, five Muslim assistant geologists from the Geological Survey of India applied for service in Pakistan and were appointed as geologists. The Geological Survey now consists of one director, eight geologists, seven assistant geologists, and three chemists. It is planned to have 15 more geologists, one mining engineer, three drillers, and three geophysicists. Two thirds of the country have been surveyed on a scale of ¼ in. to 1 mile.

In December, 1951, the Government asked T.A.A. to organize an economic development survey team to study development possibilities in the northern part of Baluchistan State Union. In co-operation with F.A.O., T.A.A. assembled a team consisting of a leader and five experts. This team included an expert on mining. He was asked to make a reconnaissance survey of mining, to advise on the further utilization of aerial survey, and to appraise resources. This expert started work in June, 1952, and his report and recommendations were included in a report from the team issued in September, 1952.

Philippines

The Geological Survey has a staff of 40, but not all its geologists were graduates in this subject. Only a small portion of the country has been geologically surveyed. One of the principal problems of the mining industry in the

Philippines has been the high cost of production, due primarily to low grades of ore, a dearth of mining machinery, replacements or supplies, and a scarcity of experienced mine labour. Another difficulty was the lack of sufficient venture capital for rehabilitation. The Bureau of Mines has undertaken various activities in order to promote and develop the entire mining industry.

Thailand

The development of mineral resources in Thailand is largely the responsibility of the Royal Department of Mines. In recent years the Department's main efforts have been directed towards the development of two lignite deposits and one gold-bearing area, and drilling for oil in the north. The Geological Survey Division is at present under the Department of Mines. It consists of 14 geologists, five mining engineers, two mechanical engineers, one petroleum engineer, and five chemists. No systematic survey has been made, but a provisional geological map on a scale of 1 to 2,500,000 is now available.

MAJOR DIFFICULTIES

In order to carry out additional surveys, five major obstacles must be overcome. Reference has already been made to the shortage of technicians and the lack of suitable topographic maps. A third difficulty in certain countries is the unsettled conditions which now prevail. Geological work depends above all on security. Since World War II, the security situation has been the chief factor in hindering surveying work in Burma, Cambodia, Laos, Viet-Nam, Indonesia, and Malaya.

The Geological Surveys in various territories are also handicapped by insufficient appropriations. In Thailand, for instance, the present budget available for regular survey work is only about $U.S.1,500 a year, which is hardly sufficient for one geologist to cover an area of 200 to 300 sq. ks. in one field season.

A fifth obstacle is lack of inducement. It is pointed out that geological work is a hard job, and prospecting for minerals in tropical territories is even more difficult. Unless the men entrusted to do the work receive sufficient pay it will be very difficult to keep them and even harder to encourage young men to enter this profession.

SUGGESTED ASIAN CONGRESS

An interesting suggestion put forward by E.C.A.F.E. is the formation of Asian geological and mining congress. The region already has several well-known technical associations, such as the Geological, Mining and Metallurgical Institute of India, the Geological Society of China, the Chinese Institute of Mining and Metallurgical Engineers, the Geological Society of the Philippines, the Geological Society of Japan, the Japanese Mining Association, etc. There is, however, no regional organization. Since the development of mineral resources of the region needs the co-operation of all experts and the co-ordination of their efforts, it seems desirable to have an organization which might be called the Geological and Mining Congress of Asia, and which would correspond to sister organizations in North America and Europe. The decision to have such an organization lies, of course, with the regional experts themselves, but there are very strong arguments in favour of its formation. The Secretariat of E.C.A.F.E. has offered to serve as a co-ordination centre during the initial stage of formation.

The Mining Industry of Finland

In a recent issue by the Overseas Economic Surveys lately published, Mr. J. H. Wright, First Secretary of the British Legation at Helsinki, reports on the mineral industry of Finland.

By the U.S.S.R. Peace Treaty, Finland lost some important ore deposits, amongst them the large nickel deposit, together with the mine and smeltery, at Petsamo; the extensive complex ore deposits at Pitkäranta, where a tin concentration mill was in operation; the lead mine with a concentration mill on the Petsamo coast at the end of the Peuravuono-fjord; the lead mine at Säkkijärvi; the deposit of titaniferous iron ore at Vuorijärvi in Salla; and the large limestone deposit with its works at Ruskeala. All except the deposit at Vuorijärvi were being worked by the end of the war. The following are the principal ore deposits of Finland which are being worked at the present time:

Outokumpu: The largest deposit of copper ore in Europe; it is worked by the State-owned Outokumpu Company. About 600,000 tons of ore are mined annually, yielding about 80,000 tons of copper concentrates (corresponding to about 16,000 tons of metallic copper), about 190,000 tons of pyrite concentrates and about 4,500 tons of zinc concentrates. At the Harjavalta Copper Smelter of the Outokumpu Company a new method of smelting copper ore has been introduced. The ore is smelted without using electric energy or extraneous fuel by utilizing the burning components of the copper concentrate (sulphur and iron). A furnace for employing this method was built in 1948-49 with an annual capacity of 24,000 tons.

Ylöjärvi: The yearly output is about 100,000 tons of ore, yielding about 4,000 tons of copper concentrates and smaller amounts of arsenic and tungsten concentrates.

Aijala: About 100,000 tons of ore are mined annually, yielding about 8,000 tons of copper concentrates and about 10,000 tons of sulphur concentrates.

Haveri: The annual output of ore is about 70,000 tons, yielding gold and small amounts of copper concentrates by means of the cyanidization method.

Orijärvi: About 30,000 tons of ore are obtained annually, partly from old waste heaps, and small amounts of zinc, copper, lead and sulphur concentrates are produced.

Otanmäki: Preliminary work and experiments are at present being carried out at this comparatively recently discovered field. It is hoped to start production on a commercial scale within two years when an annual output of 500,000 tons of ore is expected. The yield is expected to be about 175,000 tons of iron concentrates and 75,000 tons of ilmenite concentrates.

In Lapland placer gold is washed, production amounting to 560 kilos in 1951. About 2,000,000 tons of limestone are quarried annually, nearly a third of it underground.

About 50,000 tons of asbestos rock are quarried annually at Paakkila and Maljasalmi.

Quartz, feldspar, talc, soapstone (talc-magnesite rock), granite and other rocks suitable for building purposes are quarried in Finland.

Finland has toll-agreements with Western Germany and Belgium for the refining of non-ferrous metals. The Outokumpu Company sends cupro-nickel concentrates and sinters to Western Germany and receives copper nickel, cobalt, zinc, and iron in return. The agreement with Belgium is for the refining of zinc.

Gravel Pump Mining in Malaya

By P. J. TYRRELL B.Sc.(Eng.), A.M.I.E.E., A.M.I.Mech.E.

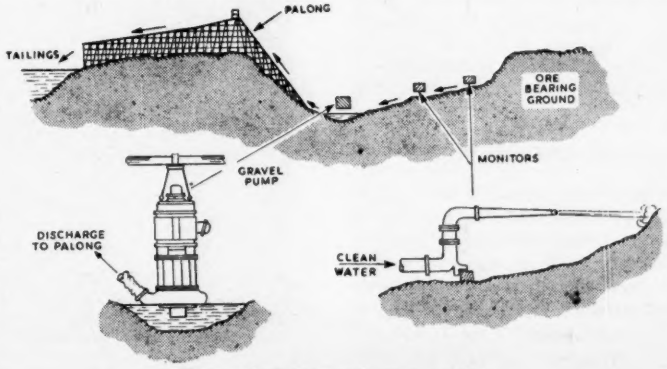
Malayan tin ore, which annually provides about one third of world output, is won principally by dredging or sluicing the alluvial deposits formed by erosion in the main granite range. A high proportion of this output is produced by gravel pump mining, and the following article discusses some of the problems that have influenced the replacement of the horizontal gravel pump by a vertical shaft unit for operations of this nature. We are indebted to *BTH Activities, Vol. 24, No. 3,* for the following informative article.

The principal tin producing countries of the world are Malaya, Indonesia, Bolivia, Nigeria, Thailand and the Belgian Congo. These six countries supply over 82 per cent of the world's annual output. In Malaya the production of tin concentrates exceeds that of any other country and the industry employs directly some 48,000 people. The production of tin, which is one of the rarest yet most indispensable of the base metals, is a vital factor in Malayan economy and in the dollar earning capacity of the Commonwealth.

A Malayan gravel pump mine

In order of output, the mining methods employed in Malaya are dredging, gravel pump mining, lode mining, dulang washing, hydraulicking and open-cast mining.

The bucket line dredge represents the most efficient method of winning the ore as the low operating cost enables low yield ground to be worked, producing concentrates economically unobtainable by other methods. The location of the alluvial deposits in many parts of Malaya is particularly suitable for dredging as the bed-rock is flat and soft, but the method is less efficient where the bed-rock is undulating as the rich deposits in the hollows between pinnacles cannot be reached. This latter fact, coupled with the low first cost of equipment, has made gravel pump mining of considerable importance in Malaya. The method is particularly favoured by the many Chinese operators and to-day the output from gravel pump mines is approaching 80 per cent of the total dredged output.



The method of gravel pump mining

An average Malayan ground yields 0.3 to 0.6 lb. per cu. yd. of tin-ore which is between approximately 0.01 per cent and 0.02 per cent by weight on the basis of an average ground weight of 3,200 lb. per cu. yd. Poorer grounds are frequently worked, often in the hope of locating richer pockets beneath.

The process of the

A palong, or sluice

gravel pump can be divided into a number of separate operations. The ore-bearing ground is reduced to a free running state or slurry by agitation from high-pressure water jets ejected from monitor nozzles supplied by a centrifugal water pump. Secondly, the slurry bearing the tin ore flows by gravity from the working face along natural channels in the bottom of the mine to the lowest point or mine "sump." The slurry is then elevated by a gravel pump to the top of a "palong" which is an inclined flume, usually erected on a trestle structure but sometimes on sloping ground. A few mines use jigs in place of palongs but despite the crude appearance of the palong it has the advantage of acting as a conveyor for the tailings in addition to its primary function as a separator.

The gradient and flow of the palong are so arranged that the heavy tin concentrates are trapped by a series of lateral baffles of varying depths. The water, containing light clay and sand suspension, passes over the baffles and is discharged from the lower end of the palong to the tailings area. When sufficient low grade concentrates have been trapped, the flow from the gravel pump is stopped and the concentrates are washed by a stream of clean water. The concentrates are then removed to a separate plant for final and efficient cleaning. It is usual for the palong to be constructed with two flumes in order that a continuous sequence of gravel pumping and washing can be maintained.

IMPORTANCE OF THE GRAVEL PUMP

It can be said that the heart of the operation is the gravel pump. For many years it has been common practice to use horizontal pumps manufactured in Malaya. Pumps of this class range in size from 4 in. to 14 in. and have a cast-iron casing, split on the vertical centre line with renewable casing liner and renewable impeller shoes. Pumps of this type are capable of passing large diameter solids and are either belt or direct driven by standard, horizontal, foot-mounted slip-ring motors. BTH Type RW machines have proved particularly successful for this class of drive but the horizontal shaft unit has a number of marked operational drawbacks and this type of motor-pump is rapidly giving way to vertical shaft pumps, driven by special vertical motors—an arrangement in which the whole unit is suspended above the mine sump with the pump semi-submerged.

The function of the gravel pump is to transport solids. The optimum percentage of solid matter depends on the class of spoil but a good average range for a gravel pump to handle is 10 per cent to 15 per cent of solids by volume although there are instances of gravel pumps handling up to 25 per cent and even 40 per cent of solids.

Sampling tests and average monthly outputs indicate that on the average Malayan mine the percentage of solid matter transported by a horizontal gravel pump is between three and five per cent. It has long been recognized that this proportion is too low for efficient operation, as by increasing the volume of solids, the monthly mine output will of course rise, with a negligible increase in the power consumption of the gravel pump.

EXCESSIVE DILUTION OF SLURRY

There are two principal reasons why excessive dilution of the slurry occurs in many Malayan mines. One reason is that a stiff ground is sometimes encountered which can be released only by persistent jet agitation. This utilizes a high volume of water in relation to the volume of ground released. There is no real solution to this problem except to increase nozzle pressures (which may prove uneconomical) or to employ excavators to break the stiff ground prior to monitoring. The second reason for low solid content is directly linked with the permanent nature of a heavy horizontal motor-gravel pump installation. A motor-pump of this type requires a reasonably strong and level foundation and its removal is an expensive operation. The erosive action of the monitors causes the mine contours to alter

Hydraulic monitor in operation

rapidly (with a single eight inch gravel pump, 15,000 to 20,000 cubic yards of ground are transported each month) and consequently the working face is soon at a considerable distance from the gravel pump sump. As a result the slurry must be well diluted in order that it may run freely to the sump. This is particularly true in the case of the shallow mine where the run-in channel may be almost horizontal and, in fact, it is often necessary to reverse the monitor or to employ auxiliary jets to wash the slurry along the channel. This second cause of excess dilution can sometimes be overcome by using an excavator to dump a proportion of the ground it breaks into the mine sump. A better solution is to keep the gravel pump as near to the working face as possible. This may mean moving the pump and motor at intervals of a few months and is obviously impractical and uneconomical in the case of a cumbersome unit requiring a solid and true foundation.

In the case of a deep mine a further problem appears. Here the expansion is downwards rather than in a horizontal direction and it is necessary to excavate the sump to maintain a run-in channel. With a semi-permanent gravel pump the length of suction pipe soon becomes excessive.

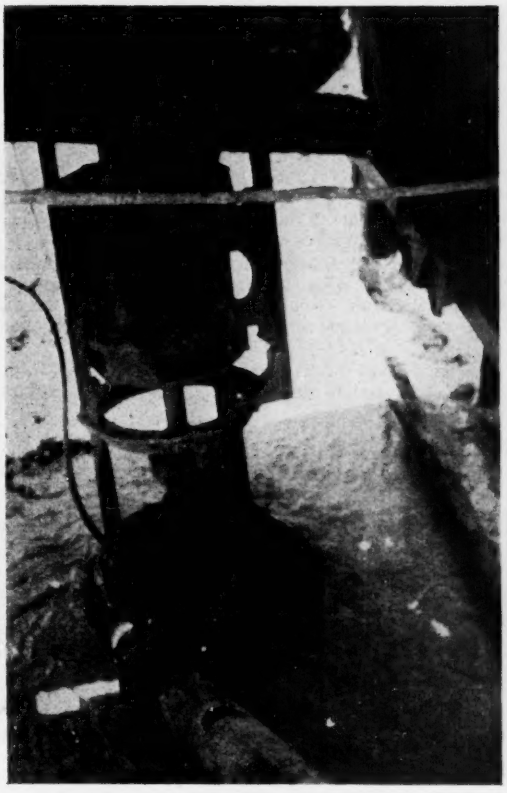
A VERTICAL SHAFT UNIT

An important step in the solution of these problems has been the replacing of the horizontal gravel pump by a vertical shaft unit, similar to the well-known sinking pump. A unit of this type can be suspended from a simple and temporary structure, does not require any foundation and the suction inlet can be of negligible length as the pump can operate with its inlet eye submerged. Furthermore, a vertical motor pump is compact and easily transportable and in many mines it becomes an economical proposition to keep the vertical gravel pump within close range of the working face. Combinations of gravel pumps are practicable, as small vertical units can quickly be erected to clear out pockets of ore-bearing ground and to transport it in high concentration to the main sump.

Several years before the war Mr. J. Payne, of the French Tekka Mines, experimented with small vertical gravel pumps on the mines at Gopeng, Perak. These were so successful that the Perak River Hydro Electric Power Company, who supply the bulk of the power for the mines of Perak, took up the development in a most active manner and supplied many of their own consumers with vertical pumping units. They are responsible for the present-day range of standardized locally manufactured vertical pumps.

To keep the cost of the vertical pump as low as possible and in order that it should be within the manufacturing capacity of local foundries, such features as renewable liners, the use of alloy steels, and the like, have been omitted from the design which comprises a circular cast-iron casing, a cast-iron runner door with integral suction intake, and a cast-iron impeller with renewable shoes of the same material. The impeller is mounted on the screwed end of a mild steel shaft which is a running fit in a water box bolted to the top face of the pump casing.

Standardized Malayan manufactured pumps are now available in five inch to eight inch sizes. As the pumps do not incorporate any balancing device and the casing is of circular section, both axial and radial thrusts appear. The pump has no thrust bearing and the axial thrust plus the weight of the moving parts must be taken by the motor thrust bearing. Tests indicate that a 150 h.p. eight pole motor driving an eight inch pump must withstand a total downwards thrust of up to three tons plus a radial thrust which appears as a side force on the motor shaft. The duty is made even more severe by the occurrence of shock loads due to oversized material entering the pump. It is not surprising that with horizontal motors converted for this



100 h.p. motor on locally converted gravel pump unit

type of drive, premature bearing failures sometimes occur but nevertheless large numbers of converted 60 h.p., 100 h.p. and 150 h.p. horizontal Type RW slip-ring motors are operating successfully.

The need for a vertical motor specially designed for gravel pump drive has been met by the introduction of a range of BTH vertical machines having a number of special features. These include reinforced end bracket and yoke design to withstand the high thrusts and to ensure long bearing life, lifting lugs of adequate strength, together with a special skirt which enables a standard Malayan manufactured pump to be fitted simply by bolting the pump to the bottom face of the motor skirt and inserting the half-coupling bolts.

The pumping unit is suspended from a chain block which, in turn, is attached, either to a tripod or to a horizontal wooden beam forming part of a simple "pump house" structure. This pump house comprises four vertical timbers driven into the floor of the mine, with cross members, an "attap" roof and a small operating platform which carries the control gear.

The motors used in Malaya are wound for a 400/440 volt, 50 cycle, three phase supply and with BTH machines a Type OP 1, Form K 2 oil circuit-breaker is used for stator control. As the inflow to the sump varies, speed control of the gravel pump is essential. Continuous running at speeds 20 per cent to 30 per cent below full speed is frequently necessary.

It is usual to employ three to six monitors per gravel pump. Nozzle pressures range from 60 to 100 lb. per sq. in. The flow depends on the size of gravel pump and the number of monitors per pump. The monitors are supplied from a conventional centrifugal water pump, usually driven by a standard horizontal slip-ring motor. The motor h.p. is usually in the 140 to 300 range.

MACHINERY AND EQUIPMENT

A Speedy Loader for Quarry Operation

The Merton Overloader, which has recently become available for the first time in this country, was given mention in *The Mining Journal* of November 21, 1952. The unit is designed for use with the Fordson Major tractor and now is reported by the distributors, Mackay Industrial Equipment Ltd., to be proving its ability by speeding up many loading operations.

As an example, the illustration published herewith shows how the turn-round of lorries at the Leicestershire quarries of the Mountsorrel Granite Group has been speeded up by the use of the Merton overloader. The machine in the illustration is equipped with a ½ cu. yd. bucket.

The eight-wheel Foden truck depicted was loaded with 13 tons of 1½ in. granite chippings in 7½ min., and 6 ton trucks were loaded in 3½ min.

The Merton Overloader loading an eight-wheel Foden truck

The operating principle of the loader allows the bucket to be "crowded," and thus a maximum load is obtained, while at the same time the application of the principle permits the machine to operate in narrow cuts and confined spaces where the only limitation is the width of the machine itself.

Overhead Conductors for Electric Underground Haulage

The use of electric locomotives with overhead contact-wire collection can greatly increase the capacity of main roadway haulages underground to deal efficiently with the high outputs of modern mining machinery pieces and so avoid bottlenecks between working face and shaft bottom. Such systems have proved successful in various countries, and their use in safe roadways is being considered by the National Coal Board.

An example of this type of equipment has been given recently by British Insulated Callender's Cables Ltd., who describe a particular installation in an iron ore mine where an 80 h.p. 250 volt D.C. locomotive accommodated approximately 400 tons of ore per shift.

The general arrangement shows that contact wire systems for underground railways supported from hanging wall are set with rails, roof arches and other supporting metal work efficiently bonded together. At present, in the United Kingdom, the electric supply must not exceed 250 volts D.C. For considerations of safety and voltage drop the overhead conductor system is divided into electrically separate sections, limited in this country by regulations, to a maximum of 500 yd. in length. Each section requires a disconnecting switch for isolating purposes and may be supplied separately from its own feeder cable.

The component parts comprise contact wire, contact wire supports and line sectioning. The contact wire is grooved to provide a seating for the mechanical ears which secure it to the supporting hangers, thus allowing the contact surface to be free from any obstruction. Material may be copper or cadmium-copper, the latter material having superior mechanical and wearing characteristics with a minimum of reduction in conductance. The cross-sectional area of SWG gauge wire of 1/0 to 5/0 ranges from 0.082 sq. in. to 0.147 sq. in. diameter from 0.346 in. to 0.457 in., and the approximate weight ranges through the five gauges comprising the range from 0.318 lb./ft. to 0.565 lb./ft.

The grooved contact wire is clamped by mechanical line ears of non-ferrous alloy to insulated supports with insulators of porcelain or moulded composition. To ensure an adequate length of insulated run under severe conditions, two normal section insulators of "dumb-bell" construction are used in tandem. The renewable insulated runners are of wear-resisting material and are reversible, whilst the "dumb-bell" installation provides a backbone which ensures a high working strength in tension.

Face Protection from Upward-Projected Particles

Amongst operators of high-speed grinders, drills and similar tools that tend to project particles upwards at high velocity, there is a demand for a device that will guard the face more effectively than conventional goggles or headband. This is said to be provided by the use of suspended face shields.

The Protective Industrial Clothing Division of the R.F.D. Co. Ltd. have now produced the R.F.D. Shoulder-Braced Face-Guard. This is stated to represent a completely new departure in facial protection, the shield being firmly supported by comfortable felt-lined shoulder braces. A lightweight chemical-proof or flame-proof fabric bib is attached to the lower edge of the shield to protect the neck and chest. The full-vision face shield, which is supplied clear or tinted and is trimmed with aluminium, completely protects both front and sides of the head. The whole equipment can be adjusted or released in a moment, and while wearing it the operator has both hands completely free.

Splicing Wire Ropes

Various methods of splicing wire ropes exist. Splicing may be defined as a "securing of the ends of a rope into its own part by interweaving the strands," and for the usual run of engineering and mining work the general practice is to produce a vertical splice. This is accomplished by the clamping of the terminal, or eye end, in a vice while the rope is secured in a vertical position.

The splicing of wire ropes is one of the minute factors so important in the mining industry, where wire ropes are put to a multitude of uses, and where the underground rigger is an employee of experience. An interesting pamphlet published by British Ropes Ltd. entitled, "Terminal Splicing of Wire Ropes," by A. B. Watts, presents details of a practice that is a traditional method in mines the world over.

The pamphlet gives instructions for a 5-tuck splice, end splices in 17 x 17 multiple stranded rope and 34 x 7 multiple stranded rope, and fitting a Bordeaux connection.

Correspondence

TRENDS IN METAL MINING

To the Editor, *The Mining Journal*.

Sir,—As I have been away, the interesting letter of Mr. J. B. Richardson, which appeared in your issue of June 5, has only recently come to my notice. In it, Mr. Richardson commented on my earlier remarks relating to pneumatic drill supports or air legs.

Arising out of that letter, perhaps you will allow me to make it clear that British Flottmann Drill is an entirely British company, with memberhip in the Federation of British Industries and other essentially British organizations. All products sold by the company are of British manufacture.

My company has no German associates, and, in fact, its only interest in Germany is that arising out of direct competition in some of the many important overseas markets in which British Flottmann Drill is so successfully active.—Yours faithfully,

Managing Director, H. T. STEER,
The British Flottmann Drill Co. Ltd., June 22, 1953.
Allensbank Works, Cardiff.

METALS, MINERALS AND ALLOYS

President Eisenhower continues to experience Congressional opposition to his plans in various directions, and it is thought that conciliation will have to give way to Administration pressure before long. His nomination of Mr. Tom Lyon for the post of director of the U.S. Bureau of Mines has resulted in the Secretary of the Interior, Mr. McKay, asking for the nomination to be withdrawn. Main opposition is said to have developed from Mr. John Lewis, President of the Coal Miners' Union.

The International Union of Mill and Smelter Workers has announced that a nation-wide strike vote will be taken on July 16/17, following on negotiations with the representatives of the leading mining and production companies which they say have been proceeding for some two months without any offer of wage increases, despite the fact that substantial wage increases have been granted to the steel workers and employees in other basic industries.

Reports of disagreements within the C.I.O. between Mr. McDonald, leader of the U.S. Steel Workers, and Mr. Reuther, President of the whole C.I.O. organization, has led to reports that Mr. McDonald is now collaborating with Mr. John Lewis, the Coal Miners' leader, on the possibilities of a combination of employees in the Coal and Steel Unions.

The N.P.A. announces the removal of allocation controls from molybdenum, cobalt and columbium-tantalum. In the case of the last named, restrictions on use remain. Nickel is now the only metal over which full controls still remain in force in the U.S.

COPPER.—Copper news has been scarce this week with U.S. consumers holding off the market with the advent of the holiday season. Possibly the chief point of interest centres round the intentions of the Chilean government in view of the declining exports and growing stocks. At a recent Press conference in Santiago, the Finance Minister, Sr. Felipe Herrera, said that though there were persistent reports abroad that the price would soon fall, the government were fully aware of the true market situation. In this connection it may be worth recalling that M. Sengier told the annual meeting of the Union Minière last week that in the presence of all the new factors he would abstain from making forecasts as to the future. His speech, reported elsewhere in this issue, is a valuable presentation of the current position of copper. Incidentally, he is reported to have made an interesting suggestion anent the U.S. government stockpile, which, he said, could usefully serve as a regulator of market prices, purchasing when production was in excess of demand, and selling when the opposite position developed.

LEAD.—With the holiday situation dominating the position in the U.S. there is little fresh to report this week in this metal. Prices on the Metal Exchange are somewhat firmer since our last and closed Thursday at £92¼ prompt and £89¼ forward.

TIN.—Since our last week's report tin prices have sagged generally despite occasional small recoveries. This may be attributed partly to the seasonal let-up of activities in the U.S. but probably more to the termination of the working party deliberations in Brussels without prospect of any early intervention in the way of international action. United States' sentiment is reflected in a statement by Mr. Ilgenfritz at the National Association of Purchasing Agents, who said that prices would go below the present levels when stockpiling ended, and that programme would soon be complete. Bolivian exports in April were again heavy, being reported as 3,593 tonnes, bringing the four months' total up to 11,797 tonnes, or 1,111 tonnes above the same period of last year, and this despite the low exports for January and February. Whatever may be the ultimate consequences of the nationalization of ownership and management of the big mines and the failure to secure a long-term delivery contract with U.S., it clearly is not so far resulting in a decline in output.

ZINC.—The zinc market, though quiet, has been somewhat firmer this week, Thursday's Metal Exchange price being £72¼ for prompt and forward.

In the U.S. interest is centred chiefly on the prospects for August and the Fall. These would appear to be regarded as favourable.

ALUMINIUM.—With the freeing of aluminium for private trade, producers have lowered their price £11 to £150 per ton, which is slightly below the U.S. parity. This is £5 lower than the Ministry of Materials had forecasted, and suggests that the suppliers are anxious to encourage consumption of the metal as much as possible. They will take over 33,000 tons of the Ministry's stocks at the new price. It is judged unlikely that this quotation will be revised under six months. Corresponding reductions in premiums for high purity metal and metal in special form will be quoted on application to the Aluminium Union.

It is reported from Washington that the Harvey Aluminum Company has reached agreement with the G.S.A. for construction of a primary aluminium plant. This is the only fresh company which so far appears to have succeeded in getting into the sphere of primary aluminium production, in spite of the Administration's wish to increase the number of independent producers.

The Reynolds Metals Company is proposing to establish rolling mills in the Philippines at an estimated cost of $3,500,000, the firm supplying half the total investment; initial output is expected to be 3,500 tons. In the first instance pig aluminium will be imported from the U.S., but eventually from a projected production plant in Mindanao.

Production in Japan is running at about 3,500 tonnes monthly.

COBALT.—M. E. Sengier, chairman of the Union Minière, states that the company's cobalt output increased last year to 6,831 tonnes and is steadily rising. Production is in the form of granulated refined cobalt from the electrolytic works at Shituru and copper-cobalt alloys from the Mpanda electric smelter. The extension to the Shituru works to give a yearly output of 4,000 tonnes has now been completed.

NICKEL.—The International Materials Conference has allocated 36,315 tonnes of nickel and oxides for the third quarter of the year showing little change on the second quarter's citation. Individual assignments are: U.S.A. 25,078 tonnes; U.K. 5,470 tonnes; Western Germany 1,405; France 1,136; and Canada 1,125. The remaining 31 nations all receive much smaller quantities. Mr. Hall, Vice-President of the Quebec Nickel Corporation, stated recently that the deposits uncovered some 50 miles north of Kenora where milling has been in progress for the past 15 months may turn out to be the largest yet found in Canada. Dr. Harold Way, the company's chief consulting engineer, stated recently that the ore will assay more than ten per cent nickel.

The International Nickel Company is engaged on large-scale expansion of two of its Sudbury mines as the outcome of a purchase agreement with the D.M.P.A. This is expected to add some 60,000 tons of nickel to the U.S. supplies in a relatively short period and bring the agency's emergency expansion programme close to completion. The contract provides for delivery to start in December next.

TUNGSTEN.—There is again nothing fresh to report marketwise this week. U.S. output, imports, consumption and stocks all increased during the first quarter of the year. U.S. production is reported as 2,123 s.tons of 60 per cent WO_3. Consumption is given as 2,142 s.tons, while stocks at the end of the month rose to 3,323 s.tons. Imports were heavy and amounted to 6,897 s.tons. Chief shipping countries in order of magnitude were as follows: Spain, 877 s.tons; Bolivia, 803 s.tons; Korea, 789 s.tons; Canada, 775 s.tons; Portugal, 667 s.tons; Brazil, 618 s.tons; with smaller amounts from a number of other countries. A Tungsten Institute has been formed with headquarters in Washington.

URANIUM.—An increase in the Australian price has been announced by the Commonwealth Minister of Supply. The prices which are guaranteed for a minimum for five years from the 1st of this month range from £A10 per ton for ore going 0.25 per cent uranium oxide to £A504 for ore containing 10 per cent. The Atomic Energy Commission will buy up to 20,000 tons a year from any one producer.

Iron and Steel

Fixation of Monday, July 13, as " the appointed day " for the de-nationalization of the iron and steel industry, puts an end to a period of uncertainty. On that day all iron and steel securities held by the State will be transferred to " Ishra "—the Iron and Steel Holding and Realization Agency—and the Iron and Steel Board, which is to supervise the general policy of the industry, will officially take up its duties. But these changes in ownership and control will have little visible effect upon day-to-day operations. Realization of steel assets will be a prolonged and complex operation. It is not expected that the first public offer will be made before September and in the meantime steel makers are applying themselves to the immediate task of providing maximum tonnages for home and export.

It may not be long before there is a steel surplus. Not only British but also world production is rising rapidly. But there are still shortages, and the weight of material on order for delivery within the next three months has reached impressive dimensions. Operations of ship builders and boiler makers are still retarded by the scarcity of steel plate but arrangements have been made to import further tonnages from abroad and progressive improvement is promised. There are indications also of a revival in the demand for tin plate. Owing to the recent slump some of the old hand mills in South Wales have been laid idle but the position is improving and the Minister of Supply insists upon the retention of rationing in this branch of the industry.

Some of the foundries are finding it difficult to maintain full employment. The export trade in light castings is very quiet and the prospects of a revival of home demand is doubtful. On the other hand, foundries catering for the engineering and motor trades are very busy and apart from small surpluses of high phosphorous iron the whole of the output of the blast-furnaces, which has been raised to record levels, is fully absorbed. Indeed, haematite and certain types of refined iron are very scarce and foreign iron is still being imported.

Rather more iron and steel scrap is now coming forward but far bigger tonnages would be welcomed at the steel works.

The London Metal Market

(From Our Metal Exchange Correspondent)

The communiqué issued by the working party of the International Tin Study Group was not taken to indicate that an international agreement is any closer, and prices continue to sag under free offerings of metal. The price level now reached must be causing embarrassment in some quarters, and output seems likely to decrease unless there is a considerable improvement. The Eastern price on Thursday morning was equivalent to £690¾ per ton c.i.f. Europe.

Lead has been a firm market with more interest being shown by consumers both in the U.K. and on the Continent, and with near arrival lead relatively scarce a further rise in price with a widening backwardation would not cause surprise.

Zinc has remained steady with little interest being shown, but it was noteworthy that the end of the month passed without any appreciable increase in the backwardation.

It is understood the new copper contract is in its final stages, and that an attempt has been made to help buyers by limiting the grades which can be delivered on the Exchange to electrolytic copper and those grades of fire-refined copper assaying more than 99.7 per cent. The basis price will be for wirebars, other deliverable grades being subject to discount. To attract metal to the market, sellers will have a range of points at which delivery can be made.

Closing prices and turnovers for the week are given in the following table:—

	June 25		July 2	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£665	£667½	£652½	£655
Three months	£665	£667½	£650	£652½
Settlement	£665		£655	
Week's turnover	645 tons		925 tons	
Lead				
Current month	£91	£91½	£92	£92½
Three months	£87	£87¼	£89	£89½
Week's turnover	5,525 tons		4,275 tons	
Zinc				
Current month	£71⅞	£72	£72⅛	£72⅜
Three months	£71¼	£71⅜	£72¼	£72½
Week's turnover	3,575 tons		2,775 tons	

JULY 2 PRICES

COPPER

Electrolytic .. .. £252 0 0 d/d

TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £225 per ton
Crude (70%) .. .. .. £210 per ton
Ore (60% basis) .. .. .. 20s. — 22s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, 99·5% £150 per ton
Bismuth (min. 4 cwt. lots) 17s. lb.
Cadmium (Empire), 13s. 10d./14s. 4d. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £60 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) £280/£295
Osmiridium, £40 oz. nom.
Osmium, £65/70 oz. nom.
Palladium, £7 15s./£8 10s. oz.
Platinum, £27/£33 5s.
Rhodium, £42 10s. oz.
Ruthenium, £25 oz.
Quicksilver, £70 5s./£70 10s. ex-warehouse
Selenium, 30s. 6d. nom. per lb.
Silver 74d. f.oz. spot and f'd.
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 60% 8s. 9d. lb. c.i.f.
50% 7s. 9d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (lumpy) £14 8s. 0d. per ton c.i.f.
,, ,, (concentrates) £14 8s. 0d. per ton c.i.f.
,, ,, Refractory £14 0s. 0d. per ton c.i.f.
Baluchistan Metallurgical .. £16 11s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26 - £27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. 103s. 10½d. per unit c.i.f.
Wolfram (65%) .. .. .. World buying 305s. - 315s.
,, ,, ... 335s. Selling
Scheelite .. .. World buying 290s. - 300s.
,, ... 325s. Selling
Tungsten Metal Powder .. .. 25s. 9d. nom. per lb. (home) (for steel manufacture)
Ferro-tungsten .. .. .. 22s. 10d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £35 13s. 9d. d/d per ton
Ferro-manganese, home .. .. £49 15s. 0d. per ton
Manganese Ore U.K. (48%-50%) .. .. .. 6s. 1d. per unit
Brass Wire .. .. 2s. 6½d. per lb. basis
Brass Tubes, solid drawn .. 1s. 11d. per lb. basis

U.K. METAL & MINERAL IMPORTS—MAY 1953

	Units	*May* 1953	*Jan.-May* 1952	*Jan.-May* 1953	*Increase or decrease in* 1953 *over* 1952
Non-ferrous metals and manufactures :					
Aluminium and alloys	Cwt.	368,200	1,808,502	1,096,360	—712,142
Bismuth*	Lb.	6,566	277,092	179,120	— 97,972
Cadmium**	Lb.	67,248	948,376	245,881	—702,495
Cobalt and Alloys**	Lb.	586,590	1,318,689	1,601,538	+282,849
Copper Electrolytic	Cwt.	326,759	1,822,020	1,776,452	— 45,568
,, Other sorts	Cwt.	284,622	1,419,040	1,097,216	—321,824
Lead	Cwt.	454,212	1,670,180	1,444,650	—225,530
Mercury	Lb.	72,250	405,060	701,390	+296,324
Nickel	Cwt.	29,062	48,362	80,576	+ 32,214
Tin	Cwt.	1,728	46,860	17,397	— 29,463
Zinc	Cwt.	212,545	1,891,500	1,687,832	—203,668
Ores and Concentrates :					
Antimony ore and conc.	Tons	263	10,748	3,810	— 6,938
Bauxite	Tons	25,069	112,883	126,074	+ 13,191
Chromium ore	Tons	17,908	83,065	73,559	— 9,506
Iron Pyrites†	Tons	42,865	174,544	119,995	— 54,549
Manganese ore	Tons	43,002	200,857	217,508	+ 16,651
Molybdenum ore	Cwt.	4,051	33,023	31,745	— 1,278
Nickel ore, conc. & matte	Tons	2,734	14,890	14,750	— 140
Tin ore and conc.	Tons	8,333	22,749	22,287	— 462
Titanium : Ilmenite	Tons	3,050	55,730	38,270	— 17,460
,, Other sorts	Tons	499	4,143	2,504	— 1,728
Tungsten ore	Tons	250	2,621	2,415	— 206
Zinc ore and conc.	Tons	8,230	62,748	79,377	+ 16,629
Non-metalliferous mining products :					
Asbestos	Tons	9,550	50,512	40,579	— 9,933
Magnesite	Tons	2,751	11,262	7,505	— 4,308
Sulphur	Tons	12,949	195,813	83,288	—112,525

*Excluding bismuth alloys. †Including cupreous iron pyrites.
**The figures for 1953 are not completely comparable with those for previous years.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

There was a better tone in stock markets this week and rather more inquiries. Trading conditions generally were still quiet. The Bristol Corporation is floating a loan amounting to £4,000,000 in the form of a 4 per cent stock dated 1968/71 issued at 96½ per cent. The gilt-edged market was higher and this was encouraged by the better half-yearly revenue figures which record a considerable cut in Government expenditure.

The Kaffir market began with an easier tendency, mainly due to lack of interest, but prices picked up when dealings began for the new account. Many of the stocks were quoted ex dividend and consequently the long list of falls given below does not represent an accurate picture of the general market trend. Attention was again centred on the coming quarterly figures and hopes were expressed that better results would offset the recent disappointing interim dividends. West Rand shares were again to the fore; Blyvoors, Doornfontein and West Driefontein were all better. Blyvoor uranium plant has now started production and Doornfontein is expected to start milling ore in August. Consequently, investors were again interested in the possibilities of West Witwatersrand and West Rand Investment Trust. Stilfontein rose on rumours that the quarterly figures would disclose good results.

This more optimistic feeling received powerful support from a statement made by Mr. C. S. McLean, referred to on page 10. Johannesburg was rather overshadowed by politics, but the market remained comparatively steady as it is felt that the sterling area currently requires gold and the South African mining industry can supply it.

In the O.F.S. there was a revival of interest although here again trading conditions were very quiet. Following scattered selling there was some recovery on hopes concerning the quarterly figures.

West Africans were very quiet. Ashantis turned easier, but the market reported considerable support at the lowest level. There was little turnover and cheap buyers were unsatisfied. Paradoxically, the market is believed to be short of stock and any return of interest could have a disproportionate effect on share prices.

West Australian gold shares were much better. Buying was reported from the Commonwealth and useful gains were recorded. No exact information is available concerning the reason for this support, but it seems probable that now the peak for base metals is past some switching may be taking place into gold in hopes of an ultimately higher price for this metal. Certainly, the shares to-day stand at low levels. It is interesting to note the mtarked difference in improvement between such London registered companies as Lake View and Star, which suffer the full rate of taxation, and other concerns domiciled in Australia.

In the miscellaneous gold section, the three operating Kolar companies were all firmer following the dividend announcements. St. John del Rey also improved after the meeting. There is rather more optimism concerning Brazil's future now that the Brazilian Government appears to be taking a more liberal view of exchange rates and international trade.

Diamond shares turned easier. Platinums hardened on Cape buying, despite London selling on rumours of intended metal sales by the Russians.

Coppers were little changed, but Chartered were firmer. There are hopes that the metal price, when free dealings start in August, will be better than expected.

Eastern tin shares were generally easier on lower metal price and world production surplus. Rumours that the U.S. stockpile is perhaps not so large as was formerly conjectured, and the fact that the low price may cut out high cost producers, checked the fall.

Lead/zincs, despite steadier metal prices, tended easier.

Oils hardened with the exception of Canadian Eagles. This company operates a fleet of tankers and freight rates continue downwards.

FINANCE	Price July 1	+ or — on week
African & European	2 7/32	—1/32
Anglo American Corpn.	5½	—¼
Anglo-French	17/6	.....
Anglo Transvaal Consol.	22/6XD	—1/3
Central Mining (£1 shrs.)	28/3	+1¼d
Consolidated Goldfields	45/3	—3d
Consol. Mines Selection	23/3	—6d
East Rand Consols	2/6	—4½d
General Mining	3 1/32	—1/16
H.E. Prop	36/10½ XD	—2/6
Henderson's Transvaal	8/-	.....
Johnnies	51/3	—1/9
Rand Mines	3 1/16	—1/16
Rand Selection	30/6	—1¼d
Strathmore Consol.	32/6	—2/-
Union Corp. (2/6 units)	26/-	—6d
Vereeniging Estates	3 1/8 XD	—1/16
Writs	32/6	—3d
West Wits	45/-	—7½d
RAND GOLD		
Blyvoors	40/9XD	.....
Brakpan	10/6XD	.....
City Deep	17/6XD	—3d
Consol. Main Reef	20/7½	—7½d
Crown	32/6XD	—1/3
Daggas	3 3/32 XD	—1/16
Doornfontein	24/3	—6d
Durban Deep	38/9XD	.....
E. Daggas	15/9XD	—9d
E. Geduld ... (4/- units)	31/3XD	—1/10½
E. Rand Props	2 1/32 XD	—1/16
Geduld	4¼XD	.....
Govt. Areas	13/6XD	—6d
Grootvlei	22/9XD	—3d
Libanon	9/9XD	—3d
Luipaards Vlei	24/-XD	—9d
Marievale	20/6XD	—6d
Modderfontein East	17/6XD	—1/3
New Kleinfontein	21/3XD	—7½d
New Pioneer	19/3	—6d
Randfontein	42/3XD	.....
Robinson Deep	10/6XD	—3d
Rose Deep	14/4½	.....
Simmer & Jack	4/10½XD	—1¼d
S.A. Lands	23/1½ XD	—7½
Springs	4/6XD	—3d
Stilfontein	27/10½	+4½d
Sub Nigel	2½ XD	—1/16
Van Dyk	6/-	—3d
Venterspost	12/3XD	—1/-
Vlakfontein	13/9XD	—3d
Vogelstruisbult	33/3XD	—9d
West Driefontein	6 1/16 XD	.....
W. Rand Consolidated	52/6XD	—1/3
Western Reefs	46/10½ X D	—1/3

O.F.S.	Price July 1	+ or — on week
Freddies	10/-	—3d
Freddies N.	9/6	—6d
Freddies S.	9/4½	—6d
F. S. Geduld	2⅞	.....
Geoffries	14/9	—3d
Harmony	24/-	—9d
Loraine	9/-	.....
Lydenburg Estates	12/9	+3d
Merriespruit	7/10½	—4½d
Middle Wits	15/9	—3d
Ofsits	37/-	+1¼d
President Brand	26/1½	+4½d
President Steyn	20/7½	—4½d
St. Helena	13/4½	—1½d
Virginia Ord.	13/6	—6d
Welkom	20/-	—6d
Western Holdings	3 5/32	+1/16
WEST AFRICAN GOLD		
Amalgamated Banket	1/6	.....
Ariston	6/3	.....
Ashanti	20/1½	—4½d
Bibiani	5/9	—3d
Bremang	2/4½	.....
G.C. Main Reef	3/6	+3d
G.C. Selection Trust	6/3	—1½d
Konongo	2/4½	—1½d
Lyndhurst Deep	1/-	.....
Marlu	1/3	.....
Taquah & Abosso	3/1½	.....
AUSTRALIAN GOLD		
Boulder Perseverance	2/4½	.....
Gold Mines of Kalgoorlie	12/3	+1/-
Great Boulder Prop.	10/3	+9d
Lake View and Star	15/3	+1½d
Mount Morgan	17/3	—1½d
North Kalgurli	14/-	+1/-
Sons of Gwalia	7/-	+3d
South Kalgurli	8/-	+3d
Western Mining	12/3	+3d
MISCELLANEOUS GOLD		
Cam and Motor	9/-	—6d
Champion Reef	5/-	+1½d
Falcon Mines	6/6	.....
Globe & Phoenix	26/-	.....
G.F. Rhodesian	4/10½	.....
London & Rhodesian	4/3	.....
Motapa	2/1½	.....
Mysore	3/-	+1½d
Nundydroog	6/-	+3d
Ooregum	3/-	+1½d
Oroville	9/6	—6d

MISCELLANEOUS GOLD (contd.)	Price July 1	+ or — on week
St. John d'El Rey	23/1½	+1/3
Zams	26/-	+6d
DIAMONDS & PLATINUM		
Anglo American Inv.	3 11/16	—5/16
Casts	17/9	.....
Cons. Diam. of S.W.A.	4	—⅛
De Beers Defd. Bearer	62/-	.....
De Beers Pfd. Bearer	15XD	—¼
Pots Platinum	8/3	+3d
Watervaal	14/3	+3d
COPPER		
Chartered	51/3	+1/-
Esperanza	3/10½	+1½d
Indian Copper	4/3	.....
Messina	3 5/16	.....
Nchanga	6	—⅜
Rhod. Anglo-American	48/6	+9d
Rhod. Katanga	9/1½	—1½d
Rhodesian Selection	13/6	—3d
Rhokana	18¼	+¼
Rio Tinto	19¾	+¼
Roan Antelope	13/-	—1½d
Selection Trust	29/4½	—4½d
Tanks	55/6	.....
Tharsis Sulphur Br.	41/3	.....
TIN (Eastern)		
Ayer Hitam	22/-	.....
Bangrin	8/7½	—3d
Gopeng	7/7½	+1½d
Hongkong	6/-	.....
Ipoh	13/9	.....
Kamunting	8/3	—3d
Kepong Dredging	4/6	—3d
Kinta Tin Mines	9/9	.....
Malayan Dredging	23/3	—6d
Pahang	13/-	.....
Pengkalen	7/-	.....
Petaling	10/-	—4½d
Rambutan	11/-	.....
Siamese Tin	20/7½	—1/4½
Southern Kinta	13/6	—3d
S. Malayan	23/3	.....
S. Tronoh	7/6	—1½d
Sungei Kinta	11/3	—1/10½
Tekka Taiping	4/9	.....
Tronoh	21/3	.....
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	9/1½	.....
Beralt Tin	26/3	—1/-
Bisichi	4/1½	.....
British Tin Inv.	11/9	—6d
Ex-Lands Nigeria	3/9	.....

TIN (Nigerian and Miscellaneous) contd.	Price July 1	+ or — on week
Geevor Tin	10/-	.....
Gold & Base Metal	3/4½XD	.....
Jantar Nigeria	14/-	—3d
Jos Tin Area	11/9	—3d
Kaduna Prospectors	2/6	—3d
Kaduna Syndicate	2/6	.....
London Tin	4/9	+1½d
United Tin	2/3	.....
SILVER, LEAD, ZINC		
Broken Hill South	41/3	.....
Burma Mines	1/4½	—1½d
Consol. Zinc	22/6	+3d
Lake George	9/9	+3d
Mount Isa	30/6	—9d
New Broken Hill	18/-	.....
North Broken Hill	51/3	—1/3
Rhodesian Broken Hill	11/-	+1½d
San Francisco Mines	18/6	—6d
Uruwira	3/1½	.....
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	46/6	+1/-
Associated Manganese	46/3	—6d
Cape Asbestos	20/3	.....
C.P. Manganese	50/7½	+7½d
Consol. Murchison	22/6	—6d
Mashaba	6d	.....
Natal Navigation	60/-	.....
Rhod. Monteleo	6/3	—1/3
Turner & Newall	52/-	+3d
Wankie	13/6	+3d
Witbank Colliery	3⅞	+1/16
CANADIAN MINES		
Dome	$32XD	+½
Hollinger	$24½	.....
Hudson Bay Mining	$80	.....
International Nickel	$74¼	+2½
Mining Corpn. of Canada	£4½	+1/16
Noranda	$122	+6
Quemont	£6⅛	+⅛
Yukon	4/-	—1½d
OIL		
Anglo-Iranian	6 1/16	+1/16
Apex	38/9	+7½d
Attock	30/7½	+1/3
Burmah	43/9	.....
Canadian Eagle	27/7½	—7½d
Mexican Eagle	21/4½	+1½d
Shell (bearer)	4 1/16	+1/16
Trinidad Leasehold	24/3	+3d
T.P.D.	21/-	+1/-
Ultramar	22/9	+1/6

COMPANY NEWS AND VIEWS

Henderson's Transvaal Again Pays 15 per cent

As in past years Henderson's Transvaal Estates in the year to March 31, 1953, derived the bulk of its revenue from its subsidiary coal undertaking, profits on which advanced to £175,165 from £131,380 in the preceding year. Output from the group's operating coal company, Tweefontein United Collieries, for the year ended December 31 last, amounted to 1,317,125 tons, an increase of 77,490 tons over 1951 due largely to improved transport facilities during the last few months of the year. The demand for coal in South Africa continues to provide a steady market and more than ordinary interest attaches to the exploration work which is currently being directed to estimating probable coal reserves in areas adjacent to the existing Tweefontein and Waterpan collieries.

Aside from coal, Henderson's main interests are on the one hand in White's South African Portland Cement Co., which is making an important contribution to the big volume of constructural work in progress in the Union, and on the other in Mineral Holdings Ltd. This is a wholly-owned subsidiary through which Henderson's owns land and mineral rights in numerous districts of the Transvaal and the O.F.S. as well as the Havelock concession in Swaziland which is being explored for asbestos. Another potentially interesting property owned through Mineral Holdings is the Vryheid farm, adjoining Messina (Transvaal) Company's property. The copper occurrences on this farm, which covers an area of 9,000 acres, are believed to be similar in character of those on the Messina property and ways and means of working these deposits have been under active consideration for some time.

Henderson's consolidated profit and loss accounts for the year under review show a profit, before tax, of £222,930 against £172,595 in the preceding year due largely to the aforementioned increase in coal profits. Of this increased profit £103,706 has been absorbed in tax (including income tax on dividends amounting to £17,193), while the dividend payment remains unchanged at 15 per cent on the company's issued capital of £563,697. After placing £37,351 to reserve, the carry forward remains substantially unchanged at £171,392.

E.R.C. in 1952

The accounts of East Rand Consolidated covering 1952 include, for the first time, a consolidated profit and loss account and balance sheet in consequence of the company having acquired control of two concerns in which it previously held a minority interest—The African Exploration Company Ltd. (now wholly-owned) and Olympus Consolidated Mines Ltd. The consolidated accounts, however, reveal much the same pattern as before, and show that by far the greater portion of the company's assets are in investments which stand in the balance sheet at £539,139 compared with £598,524 a year previously.

E.R.C. has a widely spread portfolio of investments in mining, and mining finance companies whose interests are centred principally in Southern Africa. In particular, the company's interests are closely identified with four mining companies on the Far Eastern Rand, namely, Spaarwater Gold Mining Company, Witwatersrand Nigel, West Vlakfontein and West Spaarwater. Of these, the first two are producing mines, the former under the technical management of the Gold Fields and the latter under E.R.C.'s own subsidiary, the African Exploration Company. The other two at present being on a caretaking basis. In the Far East Rand, E.R.C. also has interests in the Oceana Development Company, a steady dividend payer, whose earnings come mainly from investments but which also has mineral rights over farms adjacent to the Wit Nigel and West Spaarwater properties.

At one time E.R.C. held fairly extensive options in the O.F.S. but in the light of drilling operations these have mainly been allowed to lapse and at the end of the year under review the total area under option amounted to only 1,560 morgen, in addition to which the company owns mineral rights on farm Moedersgift, adjacent to the southern boundary on the lease area held by Merriespruit.

In Southern Rhodesia, the company's principal interest is in Falcon Mines where chief attention now centres on the Dalny gold mine which for the past seven or eight months has been operating at its full planned capacity of 12,000 tons a month. Olympus Consolidated Mines, which is now controlled by E.R.C. is another Southern Rhodesian gold proposition, at present in the exploratory stage. A small milling plant is in operation, which is making some contribution towards the cost of development.

E.R.C.'s consolidated profit and loss account shows a small operating profit for the year of £9,015 against a loss the previous year of £84,597. In the last couple of years it has been the board's policy to write off any depreciation which may have occurred in the book value of the investments. The introduction of this policy in 1951 resulted in over £700,000 being initially written off, while in the year under review market fluctuations necessitated the writing off of a further £66,122 resulting in a net loss for the year of £73,636 (£845,027).

The chairman is Major General W. W. Richards. Meeting to be held in London on July 29.

Sons of Gwalia has a Better Year

Sons of Gwalia has, in recent years, provided a particularly good example of what a combination of labour shortage and spiraling costs can do to a basically sound mine with a long record of steady production. 1951 was perhaps an exceptionally unfortunate year in that the main winder was out of commission during half a month, resulting in a loss both of output and of underground labour which drifted away from the mine during the hold-up. However, in the report and accounts for 1952 the labour position is reported to be considerably easier (except for the lack of ready trained underground machine winders), and consequently we find both tonnage treated and gold recovery last year up to something near the 1950 figure.

Year to Dec. 31	*Milled (tons)*	*Grade (dwt.)*	*Yield (oz.)*	*Cost* per ton*	*Ore Reserves (tons)*	*(dwt.)*
				s. d.		
1950	101,112	5.1	25,628	48 10	593,530	5.54
1951	82,572	4.6	19,186	59 4	591,136	5.46
1952	95,494	5.0	23,768	58 1	572,222	5.46

* Including development charges of 1s. 7d. per ton (1951 - 2s. 10d.)

Comparing gold proceeds and mining costs for 1950 with 1952, it will be apparent that the decline in profit is due almost entirely to the increase in mining costs, which on a cost per ton basis are up by about 10 per cent. The prospect of the company being able to resume dividend payments, therefore, still appears to depend primarily on two factors, building up the labour force, and seeing an end to the inflationary spiral. On both these counts the outlook must be considered somewhat more encouraging than a year ago.

Year to Dec. 31	*Gold Proceeds*	*Mining Costs*	*Profit Before Tax*	*Taxation*	*Dividend*	*Carry Forward*
	£	£	£	£	%	£
1950	318,750	242,804	62,692	35,000	20	26,786
1951	241,039	235,772	L 7,054	Nil	Nil	16,089
1952	307,389	280,539	13,908	Cr.3,586	Nil	31,083

L indicates a loss

Considerably less development footage was achieved during 1952, the total footage being 976 compared with something over 1,500 in each of the preceding years. Last year the principal development work consisted of rising from No. 27 level on the new lode in the Hanging Wall of the Main Lode and driving on Nos. 4, 6 and 8 levels to open up extensions in the West Lode revealed by earlier diamond drilling.

Gopeng Achieves a Record Post-war Output

Although Gopeng Consolidated treated a slightly lower yardage last year, the increase in yield per cu. yd. resulted in a record post-war tin output. At the same time the yield from tin sales declined slightly as a result of an average decline of some £60 per ton from the preceding peak year, while there was an increase in cost per cu. yd. treated of some 30 per cent.

These results, which are summarized in the accompanying tables, resulted in a reduction in dividend distribution for the year at 50 per cent compared with 60 per cent in the previous year.

Year to Sept. 30	*Ground treated (cu. yd.)*	*Output (tons)*	*Yield per cu. yd. (lb.)*	*Cost per cu. yd. (pence)*	*Per Ton Ore Price* £	*Cost* £
1951	2,187,300	800	0.81	11.79	641	134
1952	1,968,000	857	0.97	15.50	579	148

Prospects for the current year point so far to a reduction in output, the total for the first six months being 336¼ tons compared with 444½ tons in the corresponding period of the year 1951/2. Moreover a portion of the current year's operations is bound to be adversely affected by the lower tin price at present prevailing and already the first dividend distributions in respect of the current year have been at 10 per cent compared with 12½ per cent in the year under review. At the same time, with mining costs averaging around £150 per ton of tin ore produced, Gopeng Consolidated is better situated than many companies to face a period of lower tin prices, even if there is to be no relief from the present tremendous burden of British and Malayan taxation which last year together absorbed more than 50 per cent of the company's gross revenue. The War Damage Commission award has now been made in respect of rehabilitation expenses on the mine, and awards are shortly expected in connection with the rubber estates in which the company is interested, but even so, the expectation is that eventually over £50,000 of rehabilitation expenditure will have to be borne by the company.

Year to Sept. 30	*Tin Proceeds* £	*Mining Costs** £	*Govt. Royalty* £	*Profit Before Tax* £	*Tax* £	*Dividend* £	%
1951	610,951	109,870	95,381	474,905	282,200	126,151	60
1952	591,433	130,199	92,367	408,328	258,808	103,889	50

* Including smelter charges.

The bulk of the tin production continued to come from the No. 1 paddock last year, where 843,000 cu. yd. were treated for a recovery of 536 tons, equivalent to a yield of 1.43 lb. per cu. yd., compared with a yield of 0.93 lb. in the previous year and compared with yields during the year under review of 0.76 lb. in paddock No. 2 and 0.52 lb. in paddock No. 3.

Work continued satisfactorily during the year on the scheme for the deviation of the Kampar water supply. Work in connection with this accounted for £18,671 of last year's mining expenditure as against £10,203 in the preceding year and was an important contributory factor in the increased mining costs.

Mr. D. W. Thomas is chairman. Meeting: Redruth, July 15.

The Kadunas Increase Output

Both Kaduna Prospectors and Kaduna Syndicate report increased outputs during 1952, and results for the first five months of the current year point to a further increase in production. Outputs for 1951 and for the year under review are given in the table below together with the financial results. Output by Kaduna Prospectors for the first five months of 1953 are reported to be 50 tons compared with 36 in the corresponding period of last year, while in the case of Kaduna Syndicate the corresponding figures are 127 tons this year against 95 tons last.

Although ore reserves are small, no light is thrown, either in the directors' reports or chairman's reviews, on what might be the effect on these of a permanently lower tin price. During 1951, however, the companies were reported to be taking advantage of the exceptionally high price then ruling to work ground which would otherwise have been uneconomic and if this policy was continued in 1952 the position in this respect may be relatively good.

Measured and indicated ore reserves of the two companies at the end of last year (i.e., before the price break) amounted to 247 tons in the case of Kaduna Prospectors, and 1,101 tons in the case of Kaduna Syndicate. Prospecting during the year by both companies only revealed small additional tonnages.

Dividend payments by both companies declined over the previous year although the percentage distribution was maintained at 33 per cent in the case of Prospectors and was increased from 50 to 75 per cent in the case of the Syndicate, due to the payments in both cases being made on a reduced capital. Chairman of both companies is Sir Godfrey Fell. Meetings are on July 7.

The following are the summarized results for the year:—

	Prospectors		*Syndicate*	
	1951	*1952*	*1951*	*1952*
Output of concentrates (tons)	69	77	258	271
	£	£	£	£
Price received per ton ...	742	688	737	687
Cost per ton	292	332	257	272
Sales of Tin Concentrates ...	48,997	51,615	194,481	154,503
Mining Costs*	32,511	37,541	117,730	117,229
Taxation	10,776	9,800	49,000	34,700
Net Profit	5,481	3,678	24,782	20,521
Dividend	5,250	3,604	25,200	19,500

* Including freight, forwarding charges and assays; also depreciation in the case of Kaduna Syndicate.

Company Shorts

Lobitos Pays 11¼ Per Cent on Doubled Share Capital.—The preliminary statement on the results of Lobitos Oilfields for 1952 indicates a sharp increase in group net profit, after payment of all charges including taxation, at £833,555 (against £470,025 in 1951). It would appear that trading profits did not improve to the extent suggested by these figures as provision for U.K. taxation is down by some £67,000 at £569,869 despite the provision of £96,050 for E.P.L. against nil, while Peruvian taxation and Labour Law provisions is down by over £170,000 at £258,050. Also, the item of £150,000 appearing in the 1951 accounts as a reserve for tankers survey repairs has not been repeated. Following on the 2½ per cent interim dividend paid last February the board now proposes a final dividend of 5 per cent plus a bonus distribution of 4 per cent, making a total of 11¼ per cent for the year on the increased share capital, which shows a slight increase over the 22½ per cent paid in 1951, before the one for one share issue from capital reserves. The annual meeting will be on July 28.

Bremang Maintains Dividend.—Preliminary figures for the year to December 31, last, announced by Bremang Gold Dredging this week, indicate a reduction in profit before tax at £124,622 (compared with £146,892 in 1951). Taxation requirements—less an overprovision for previous years of £7,327—amount to £52,528 (£88,238) while a special provision of £50,000 has been made for the cost of dredge removal. The proposed dividend remains unchanged at 7½ per cent leaving a carry forward of £20,572 (£41,964). The date of the annual general meeting has been provisionally fixed at July 28.

Ex-Lands Nigeria Again Pays 50 Per Cent. — Ex-Lands Nigeria's profit for 1952 remains virtually unchanged from the previous year at £155,123 (as compared with £155,527). Provision for taxation is £10,000 down at £86,000 while the interim and proposed final dividends totalling 50 per cent for the year remain unchanged. The carry forward shows an increase at £122,107 (£106,984). The annual general meeting has been provisionally fixed for July 28.

Scottish Australian Mining Pay 3 Per Cent.—The net profit of Scottish Australian Mining Company for the year 1952, after providing for all charges including taxation, was £363 compared with £1,115 in 1951. A taxation adjustment in the company's favour together with the balance brought in of £392 raised the amount available to £1,243 against £1,442. A dividend of 3 per cent per 4s. stock unit on the £50,000 issued capital required a net amount of £825 leaving the carry forward at the financial year end at £418 compared with £392 brought in.

The directors have decided to distribute 1½d. per 4s. stock unit out of general reserves and this will be paid, tax free, on July 17 together with the dividend. Mr. John Norman Eggar is chairman. Meeting, London, July 3.

STANLEY ELMORE RESEARCH FELLOWSHIP IN METALLURGY

Applications are invited for a Stanley Elmore Research Fellowship in Metallurgy tenable in the Department of Metallurgy University of Cambridge. The stipend of the Fellow will be determined by the Selection Committee according to the Fellow's experience and qualifications. It will not be less than £600 or more than £900 a year.

Further particulars may be obtained from the Professor of Metallurgy, Department of Metallurgy, Pembroke Street, Cambridge, to whom applications for the Fellowship should be sent so as to reach him not later than September 15, 1953.

UNION MINIÈRE DU HAUT-KATANGA

The Annual General Meeting of the Union Minière du Haut-Katanga was held in Brussels on June 25.

Mr. Gaston Blaise was in the chair.

The accounts for the year ended December 31, 1952, were adopted.

The Profit and Loss Account showed a gross profit of Frs.4,770,953,374. After deduction of the provisions for depreciation and for profit taxation, and of sundry charges, there remained a net profit of Frs.3,091,074,645. By inclusion of Frs.77,437,865 brought forward from the previous year, the available balance totalled Frs.3,168,512,510.

From this balance, Frs.1,154,553,732 were appropriated to the Reserve and the Special Reserve and Contingencies Fund, and Frs.45,030,433 were carried forward. The balance left for distribution amounted to Frs.1,968,928,345.

The Meeting approved a dividend of Frs.1,250 net per share for the year 1952. Taking into account the interim dividend of Frs.600 net paid in January 1953, the final dividend is accordingly Frs.650 net per share.

MR. E. SENGIER'S STATEMENT

In his address to the Meeting, **Mr. Sengier,** Chairman of the Permanent Committee, said:

I can but confirm the statements I made to you at the June 1952 meeting of our Company. The stability of our general position is confirmed from year to year, and the optimistic forecasts which I made previously have been more than realized.

The results which you have before you reflect an exceptional year with a record production of 206,000 metric tons of copper, as compared with 192,000 tons in 1951 and 6,800 metric tons of cobalt, as compared with 5,700 tons in 1951.

Our sales were made at market prices which exceed as I told you in 1951 and 1952, the average prices upon which one can rely in order to estimate probable profits over a normal period of several years.

There result exceptional receipts which enable us to increase the dividend and to propose to you the distribution of a net amount of Frs.1,552,000,000, after payment of approximately 2,300,000,000 in taxes and duties, of 177,000,000 in royalties to the Comité Spécial du Katanga, whilst carrying more than 1,000,000,000 to reserves and 800,000,000 to depreciation. We note on the other hand, in spite of capital expenditure amounting to 1,540,000,000, an improvement of approximately 800,000,000 in our liquid assets.

We believe it useful again this year to aggregate the receipts of the eight post-war financial years and their utilization. The receipts of these eight years amount in round figures to Frs.45,000,000,000 which have been utilized as follows:

Production expenses	approx.	44%
Taxes and royalties	„	23%
Net dividends	„	13%
Capital expenditure	„	16%
Investments and increase in cash at banks	„	4%

For the financial year 1952, the receipts were Frs. 10,550,000,000, the appropriation of which is as follows:

Production expenses	4,200,000,000
Taxes and royalties	2,460,000,000
Net dividends	1,550,000,000
Capital expenditure	1,540,000,000
Increase in liquid assets	800,000,000

It will interest you to compare three items of the 1952 expenditure which are counterpart to these receipts:

1. The remuneration of work, that is to say the aggregate of the payments to the members of the European and Congolese personnel, amounts to 1,184,000,000, i.e. 11.20% of the receipts.
2. The remuneration of capital, that is to say the net dividends to shares subscribed in cash, amounts to 1,223,000,00, i.e. 11.60% of the receipts.
3. Duties, taxes, dividends on shares issued free as remuneration for the concessions, and royalties to the Comité Spécial du Katanga, amounts to 2,792,000,000, i.e. 26.50% of the receipts.

PROSPECTS FOR THE CURRENT YEAR

Concerning prospects for 1953, Mr. Sengier said:

The last financial year and the first months of 1953 constitute a troubled period which renders forecasts for the immediate future impossible: the market has successively shown proof of excessive optimistic and pessimistic feelings, which appear to me to be worthy of a short commentary.

During this period, the laws of commercial freedom have been transgressed: an exceptional American industrial activity, massive demands for armament purposes and the constitution of governmental stocks raised fears of a shortage of metal which gave rise, on the one hand, to the reinforcement of controls and, on the other, to unjustified speculations.

This appearance of insufficency of production led the market prices of copper to exorbitant rates which have favoured the development of the production of substitutes which, if maintained, could become detrimental to our industry.

This situation encouraged on the other hand, the future development of new mines, certain of which are financed by the American Government, with guaranteed prices of 24.50 to 28.50 c.—new mines from which the production is estimated at 500,000 tons, being about 20 per cent of the present world production.

Although the purchases for governmental stocks contribute to falsify the true picture of copper consumption which is not necessarily equal to demand, one nevertheless arrives at the conclusion that, for raw materials which the United States cannot produce in sufficient tonnages to meet their consumption, such stocks could usefully serve as regulators to market prices, the purchases being made during the periods of world over-production and the disposal being made during periods when production is deficient.

MARKET CONFUSION

Here are a few figures enabling you to judge of the confusion of the market.

During the whole of the year 1952, the American domestic market price, that is to say the market price of copper produced in the United States, remained officially fixed at 24.50 c.

During these same twelve months, the market prices applied to foreign copper varied between 27.50 and 36.50 c. *The Engineering and Mining Journal* price for export copper, which fluctuated between 27.50 and 34.70 c., has been falsified by an arbitrary price imposed by the Chilean Government which at the beginning of 1952 was 27.50 c. and was brought to 36.50 c. as from June of the same year.

In February 1953, following a reduction of control, the American domestic market price settled at 27.50 c. At this same date, it was enacted that the imposition of 2 c. on imported foreign copper could only be re-established before June 30, 1954, if the average price of a given month fell below 24 c.

The height of the confusion revealed itself at the beginning of 1953 with five different prices in the United States, varying from 24.50 to 36.50 c.—plus one price in London—the Union Minière having moreover an independent price which varied, during 1952, from 28.30 to 34.40 c. with an average of 31.60 c., equivalent to Frs.35,100 per metric ton for the year.

Since May 1953, thanks to a greater freedom, the confusion has lessened, and the two principal basic market prices, that is to say the American domestic price and the export price (freed at the end of April from the influence of the Chilean arbitrary market price), drew closer to each other at a level of 30 to 31 c.

UNION MINIÈRE'S COPPER PRICES

We have pleasure in noting that responsible sources, and in particular the *Financial Times* of London, declared that the competent authorities consider the independent market prices adopted by the Union Minière as being the most representative of the world market.

The market prices in force mid-June are: Domestic market price, 29.97 c.; export market price, 29.85 c.; market price Union Minière for sales in Belgium based on 29.85 c., equivalent to Frs.33,750 per ton, c.i.f. Antwerp.

This recent fall of market prices and their alignment did not surprise us, and we consider them as a step towards a healthier position.

Nevertheless, during these last months, customers in Europe, in the uncertainty of the future market prices which showed a tendency to fall, have lived on stocks and reduced their purchases to immediate requirements.

In the United States, on the other hand, the demand, influenced by the orders from the Government which absorb 30 per cent of the domestic production estimated at 1,000,000 metric tons per year, continued to be strong. The demand appreciably exceeds this production, which must be augmented by a tonnage of imported copper which, for 1952, was in the neighbourhood of 400,000 tons.

In the face of all these new factors, we will abstain from making forecasts as to the future of the markets.

As far as we are concerned, the tonnage of copper sold to date, the profit from which will influence the results of 1953, amounts to 98,119 metric tons at an average market price of 32.28 c. per lb., equivalent to Frs.35,582 per metric ton.

Cobalt has acquired a considerable importance for our Company. Our production is increasing and its disposal is assured for several years.

NEED FOR LIQUID RESERVES

In conclusion, Mr. Sengier declared: The experience of the large copper producers proves the necessity of holding considerable liquid assets, which are necessary to meet the need for working capital for operations, the finance of capital expenditure and the reserves necessary to cover future eventualities, and, in particular, possible sudden fluctuations in the market prices of metals.

With exception of the Le Marinel power project, the financial years 1953 and 1954 will be marked by the completion of our capital expenditure programme, comprising in the first place the hydro-electric equipment of the waterfalls and the installations necessary to the development of our new mining centres.

Our prudent administration has permitted the realization of this programme without recourse to new capital.

For the years following 1954, and excepting expenditure for the completion of the Le Marinel power station, for which we are making a provision in our present liquid assets, amounts equal to a normal depreciation should be sufficient to cover current expenditure for equipment and improvement of our properties.

In short, thanks to large, well reconnoitred reserves of minerals, to a personnel of quality, and to stocks of metals and other products valued at conservative prices—three elements constituting the principal assets of any mining concern—thanks also to our cost prices which compare favourably with those of our competitors, we are convinced that with copper prices resulting from the laws of supply and demand in a free economy, and in the absence of unforeseeable events, we shall be able to continue to present you with very satisfactory balance-sheets.

HYDRO-ELECTRIC PLANS

Further to Mr. Sengier's address, the report of the Board of Directors, which has been circulated with the accounts, mentions that output of the Company's products showed a further increase in 1952.

The Company has always paid attention to the modernization of its various installations; its construction programme for 1952 included, in particular, the extension of several plants and the increase of the electric power available.

In this respect, the erection of the Delcommune power-station on the Lualaba River, has been actively pushed on. A first turbo-alternator group was commissioned last December. With this power-station in production, the Union Minière will be in a position to generate 1,100,000,000 kWh. per average year.

The survey works, relating to the Le Marinel power-station, a fourth generating plant necesssary to cope with Katanga's future requirements, are in progress. The total capacity of this installation will reach 280,000 kVA.

According to estimates, the commissioning of the first group is due in 1957.

A power transmission line to the Rhodesain Copper Belt is projected. Katanga hydro-electric power will thus contribute in a few years to the relief of power shortage in the Copper Belt.

Owing to the constant efforts of the Medical Department, the health situation develops favourably amongst the European and Congolese staff.

Union Minière has continued to expand its programme of social achievements in favour of the Congolese workers and their families. Emphasis has been laid on the extension of the responsibility granted to the Congolese, in accordance with their social progress, and on the improvement of their qualifications through better technical education.

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The Ordinary General Meeting of the St. John d'el Rey Mining Company, Limited, was held at Winchester House, London, E.C.2, on June 25.

The Right Hon. Lord Rathcavan, P.C. (Chairman), who presided, in the course of his speech said:—

The year 1952 was a difficult one in many respects owing to increased expenses in most directions while relations with labour showed some deterioration. The tonnage crushed decreased but the produce was slightly better and owing to the increase in the price of gold paid for in Cruzeiros the value was higher by £164,609. For this reason, despite increased costs, the balance of Working Profit showed a small improvement, but with higher charges for Developments, Depreciation and Taxation the net Profit at £104,377 was lower than that for 1951 by approximately £10,000. Adding £53,680 brought forward from 1951 and £19,000 for United Kingdom Taxes no longer required there is a total of £177,057 to be dealt with. The Board recommend a final Dividend of 7½ per cent net on the Ordinary Stock making, with the interim Dividend of 2½ per cent net already paid, 10 per cent net for the year. They have also decided to transfer £51,000 to Contingencies reserve and to carry forward £53,916 to next year's account.

Last year and the year before I called attention to the fact that remittances are limited and there is still no improvement in this respect, although a free exchange market has been introduced in Brazil. Nevertheless, we have to pay U.K. Income and Profits Tax on our profits in full and while the Inland Revenue do allow certain Income Tax reliefs for companies operating abroad, under the Brazilian system Mining Companies pay a Mining Tax instead of Income Tax, so this Company does not qualify for relief in the same way as other companies.

The tonnage treated during the year amounted to 381,100 tons of which 235,600 tons came from the Morro Velho mine and 145,500 from the Espirito Santo group. The average grade was 10.96 grammes (7.05 dwts.) and the value of the bullion produced was £2,958,423. This compares with a tonnage of 399,800 and a grade of 10.42 grammes (6.7 dwts.) last year, when the bullion produced realized £2,793,814. Development cost rather more at £119,167 but development in mines such as ours is of course a necessary expense in order to keep sufficient working faces available. Working Cost per ton shows a comparatively high increase from 117s. per ton to 131s. 4½d. per ton and the cost of Development has risen from 4s. 9½d. to 6s. 3d.

There has been little difficulty in disposing of the 80 per cent of the Company's gold which we are allowed to sell on the Free Market, except during one or two short periods. From January to the end of the year there was an almost steady increase in price from Cr.$40,00 per gramme to Cr.$47,00 per gramme, which accounts to a large extent for the higher revenue obtained. Since the end of the year the situation has completely changed owing to the introduction of the Free Exchange Market.

The Free Market Exchange rate is now in the region of Cr.$120,00 to the Pound Sterling against an official rate of Cr.$52,416 at which we operated for the whole of 1952 and at which the current assets in the Balance Sheet are valued. Our Auditors and your Board are of opinion that the Free Exchange rate must prevail in respect of 1953 and, if the rate remains anywhere near its present figure it is obvious that there will be a heavy Exchange loss to be dealt with in the 1953 accounts arising from the revaluation in Sterling of Current Assets in Brazil. However, by drawing on reserves and by other adjustments, it should be possible to deal with this loss without having to charge the whole of it against the results of 1953. Much will depend on the actual exchange rate at the end of the year.

The Ore Reserves at the end of 1952 amounted to 6,810,000 tons made up as follows:—5,360,000 tons in Morro Velho, 1,450,000 in Espirito Santo. The average indicated value of these reserves is 12.6 grammes (8.10 dwts.). A total of 255,000 tons has been deleted from the reserves, being those at Faria and Bicalho mines, as under present conditions it is doubtful if they will pay to extract.

The capital development programme continues to exercise the attention of our mining staff and consultants, but progress is not so fast as we had hoped due to delay in delivery of plant and more particularly to the import licensing restrictions imposed during the year by the Brazilian Authorities. It is hoped to overcome these difficulties in course of time and to some extent they have been surmounted, but delays in Brazil mean delays here and a great deal of patience is needed to obtain what is required. Sinking of the new vertical shaft has been resumed and so far it has been in good ground with no water difficulties.

The report and accounts were adopted.

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